

Guide to Internet Access and the World Wide Web

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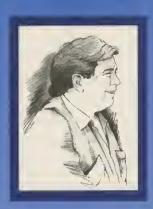


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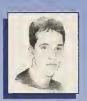
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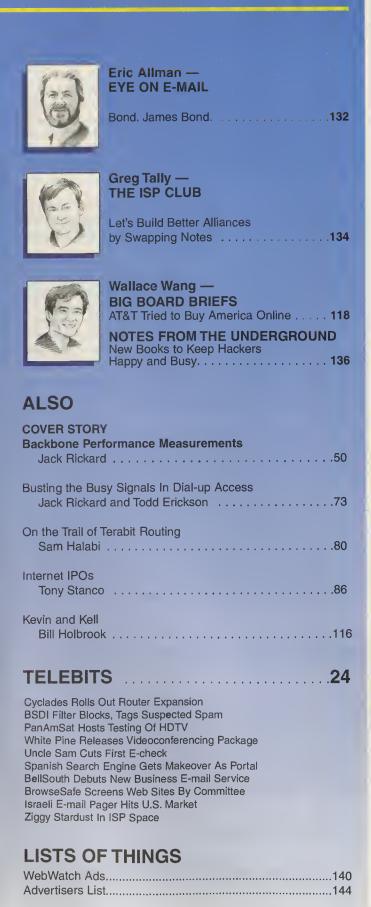


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### EDITOR'S NOTES by Jack Rickard

### IN SEARCH OF THE ELUSIVE BUSINESS MARKET

We have, at some point, moved from a technology driven industry to a financially driven industry. And currently it's entering a bit of a frenzy. MindSpring put together two back-to-back profitable quarters with a third of a million dial-up users and their stock shot up to over \$150 before the recent split. I visited this company a year ago and thought it looked promising at \$8 per share.

An acquaintance who heads a group of investor/brokers was recently lamenting the lack of available ISPs. He had been commissioned to find promising regional ISPs with a strong business customer base of dedicated access lines and he just wasn't finding much among the 4,830 ISPs available to pitch.

I found this remarkable from a number of perspectives. First, that he couldn't find an acquisition target out of a field of 4,830. Second, that he thought there WERE ISPs with a strong stable of dedicated access connection customers. But it did bring me back to ground with one of the ongoing myths of Internet access.

The common perception is that businesses all buy 1.544 Mbps T-1 connections to the Internet. And secondly, that dial-up connections are primarily home users or "consumers." This then is the major division of the Internet-access market.

It is broadly true that the vast majority of home "consumer" users access the Internet by dial-up modem over an ordinary analog telephone line. All press announcements to the contrary, there are less than 10,000 xDSL installations still—worldwide. And all the cable programs combined cannot account for 100,000 installations—in a universe where U.S. Internet access is now in excess of 60 million humanoids.

But it is not true that most businesses are connected with 1.544 Mbps T-1 connections at \$2,000 per month. This is the Internet's dirty little secret. Almost all Internet service providers LIKE to sell dedicated access connections to businesses and the 1.544 Mbps T-1 is the "standard" increment. If you call any ISP, tell them you're a business and want a connection to the Internet, they immediately start babbling about a T-1 connection. It's good recurring revenue and easy to service in relation to the monthly income. Indeed, all conversations about business connectivity to the Internet seem to imply a T-1 connection as the baseline, with T-3 connections for the Fortune 500.

It's simply not so. The overwhelming majority of businesses in the U.S. are connected with a lessor connection, a combination of dial-up, dedicated dial-up, increasingly ISDN, and a few remnant 56 Kbps Frame Relay connections.

Let's look at a very large Internet service provider that is assumed to be very business-oriented: internetMCI. As part of WorldCom's purchase of MCI and the attendant difficulties in gaining regulatory approval, MCI has agreed to sell off ALL of its internetMCI network and customer base to Cable and Wireless PLC for \$1.75 billion. In the process, they had to tell us what that consisted of for the first time.

The internetMCI purchase is interesting. The basic deal was \$1.75 billion cash and the annual income indicated for internetMCI is \$375 million - a ratio of 4.66 X annual gross even in something of a distress sale.

The company reports 250,000 consumer accounts, 60,000 business accounts, and 1,300 Internet Service Provider accounts. This would be largely indecipherable except that pricing for Internet access remains very step-like. A basic dial-up account is pretty normally \$20. And we can assume that a dedicated dial-up business account is about \$200 monthly, a dedicated 1.544 Mbps T-1 account about \$2,000 monthly, and a 45 Mbps T-3 account about \$20,000 monthly. These are rough approximations, and you can of course get quotes, even from internetMCI, all around those figures. But they're roughly accurate.

We can account for \$60 million annual income from the 250,000 dial-up accounts pretty quickly. The ISP segment is a little more difficult in that the 1,300 ISPs often take more than one connection and a relatively high percentage of even larger T-3 connections. We know that Cable and Wireless HAD agreed to pay \$625 million for the network hardware and just the ISP connections. We know the approximate ratio of ISP connections universally at 1.3 so we're going to guess the 1300 ISPs total 1,410 T-1 connections and about 150 T-3 connections. This gives us very close to \$70 million in annual revenue from ISPs. That leaves us about \$245 million in revenues from business customers - still the lion's share.

Consumers\$60 million16 percentInternet Service Providers\$70 million18.66 percentBusiness Customers\$245 million65.33 percent

Now the interesting thing here is that internetMCI also reports some 60,000 business accounts. If they were all T-1 connections at \$2,000 per month, that would render some \$1.44 BILLION in annual revenue. Good work if you can get it. But even internetMCI can't. In fact, they get about 17 percent of that and the average business account generates some \$4,083 annually or \$340 per month.

So we wind up with two formulas:

X + Y + Z = 60,000X(\$240,000) + Y(\$24,000) + Z(\$2,400) = \$245 million The mix that suggests itself is

T-3 customers	100	\$24 million	0.2 percent cust	9.8 percent rev
T-1 customers	3575	\$85.8 million	5.9 percent cust	35.0 percent rev
Dial-up/ISDN	56,325	\$135.18 million	93.9 percent cust	55.2 percent rev

This would indicate that nearly 94 percent of business customers are using a connection smaller than T-1. You can move all this around by varying the pricing models, and even get into more of a mix of what is ISDN vs. dial-up. But the end result is clearly that if you have 60,000 business accounts generating \$245 million annually, the overwhelming majority are not 1.544 Mbps T-1s. The real mix is somewhat more complicated with fractional T-1, ISDN, and the other products available.

Why would this be? In the first place, you can't have 60,000 Fortune 500 companies. They are pretty much limited to around 500 total. The remaining businesses are, of course, smaller. Their primary use of an Internet connection is actually electronic mail. And a dedicated dial-up account is frankly overkill for even a large electronic mail load. A dial-up account will even support a bit of Web browsing, though I think it's also a bit of a myth that all companies allow their employees free run of Web browsing during business hours. A dedicated ISDN account, with compression can get you over the 250 Kbps mark and handle a lot of browsing.

Bottom line is that we'd estimate internetMCI dedicated T-1 customers to be about 6 percent of their business customer base, and a little over 1 percent of their total account base. And that implies that an ISP with 10,000 dial-up users and 100 T-1 business accounts is doing as well as internetMCI, a difficult if not impossible task given the inherent bias in business to play it safe and buy from the large established brand with the national network. And they would generate about a \$4.8 million annual gross.

Rocky Mountain Internet, a publicly traded regional here in Colorado (NASDAQ: RMII), does a bit better than this. From their recent 10Q filed with the SEC, we would surmise the following:

Dial-up users:	10,500	\$17.95	\$2,261,700
1.544 Mbps T-1	151	\$1,175.00	\$2,129,100
ISDN	256	\$275.00	\$844,800
56K Frame Relay/other	80	\$150.00	\$144,000
Web hosting/design	448		\$1,257,364
Collocation	30	\$400.00	\$144,000
Miscellaneous			\$336,000

As of the end of the first quarter 1998, the company was at a revenue rate of \$7,117,140 for the year and growing. But it lost \$0.19 per each of the 6.9 million shares outstanding. Still enough to zoom it's stock to some \$16.50 per share at this writing. That gives it a market capitalization of \$113,850,000 or a whopping 16 x gross revenues. This for a company that has never earned a profit and in fact loses about 75 cents per share each year?

The reason is that it is growing and that it DOES have a very favorable mix of highspeed business dedicated connections with 151 such accounts. And even Rocky Mountain Internet's are pretty few and far between.

MindSpring (NASDAQ: MSPG) on the other hand, focuses almost entirely on dial-up accounts and now approaches 350,000 accounts with some 12,000 low cost Web hosting accounts ranging from \$19.95 to \$99.50 per month. Dedicated connections are a negligible part of their mix. Yet the company is generating \$85 million in annual revenues and was in the black during the last quarter of 1997 and the first quarter of 1998.

My conclusion is that both businesses and individuals are indeed enthusiastic about Internet access. But it is a VERY price sensitive market and dial-up and ISDN connections are not just the majority, but almost all of it. And finally, dial-up can be profitable. If you eliminate over \$5 million MindSpring spent during the first quarter on new equipment to handle the continuing 123 percent annual increase in subscribers, it becomes very profitable indeed.

Dial-up is not a dirty word. Dedicated business accounts do not automatically produce nirvana or profits. And price matters to those buying Internet access.

Jack Rickard **Editor Rotundus** 

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### LETTERS TO THE EDITOR

Address correspondence to: Letters to the Editor, *Boardwatch Magazine*, 13949 West Colfax Avenue, Suite 250, Golden, CO 80401; by fax to (303) 235-9502 or by e-mail to letters@boardwatch.com

### **BBS REMINISCING**

Jack

I have been meaning to write to you for years and never really got the steam up. Been a subscriber of the *Boardwatch Magazine* since it was deeply rooted in the BBS scene.

Have you an opinion as to whether the local BBS will indeed die off? Is there any value in keeping them going, hoping that someone will remember the good ol' days, where the local community lived and breathed?

I have been running my BBS (FONiX Info Systems) since 1984. I am an ISP these days but still run the BBS as a free service for our ISP customers, as well as for an international bunch of diehards who still call very regularly for those ILink, RIME and FidoNET packets.

With the International BBS now much easier to get to, but with an increasingly Internet-besotted user base, it's much more difficult to tell 'em that there is no SPAM on the local BBS, there are hundreds of thousands of files, some as old as the hills, and a real community spirit, just waiting for them to call in.

My question to you is, would you be interested in running an article on CONTENT PROVIDERS, with a leaning toward BBSes, mail networks etc.?

I look forward to a reply, if not in your great magazine, by e-mail.

Best regards,

Chris Kenward SysOp - FONiX Interactive BBS www.fonix.org or Telnet to bbs.fonix.org

### Chris:

In my opinion, the BBSs never died at all and never will. They got new software, new connectivity, some new terminology, and they're on the network now. The people who drove BBSs now drive the Internet. That's how I know what happened. The line of demarcation between the two is forever clearer in almost everyone's mind than it can ever be in mine. Each spring, new software.

There are a few diehards who for whatever reason cling to last year's software and techniques. Direct dial is much higher performance than the IP network, and there are still applications that use it, and still active BBS dial-up systems in existence. But they're not news, and I don't see them becoming news in the future.

Jack Rickard

### **DSL ALMOST HERE**

Hello Jack,

Well DSL has arrived.

On May 27th, PacBell (Local telco) announced they would be releasing DSL in multiple cities. I already knew this - what's different is that they actually took an order from me and set an installation date for July.

The most exciting part about this is that it's faster access at affordable prices - which means the NET is really going to change.

Voice, video, faster Web site access - etc.

From the information I have, DSL loop charges will be flat rate for PacBell. Although I heard GTE (which is the telco next door) will charge usage - which I think is just plain dumb - they've missed an entire market of Internet users that need dedicated 24/7 access.

The Pacbell rate is reasonable for the loops at \$60 for 384k down and 128k up, \$90 for 384/384 and \$189 for 1.5/384. Installation is \$610 for the works, includes the hardware and inside wiring. If I just have the outside wiring done and get my own hardware I'm looking at \$125 - which by the way is what I'll probably do.

So tell your advertisers one of my next hardware purchases in two months will be a splitterless DSL unit - and I'd be very interested in reading more about what's available to me and seeing ads regarding DSL technology.

Internet access will depend on what level of service is chosen - for consumers PacBell is charging \$30; for businesses with multiple IPs, I've not gotten the rates nailed yet but we're looking at roughly \$99 - \$350 depending on the speed and I can pick from a few upstream ISPs, including PacBell.

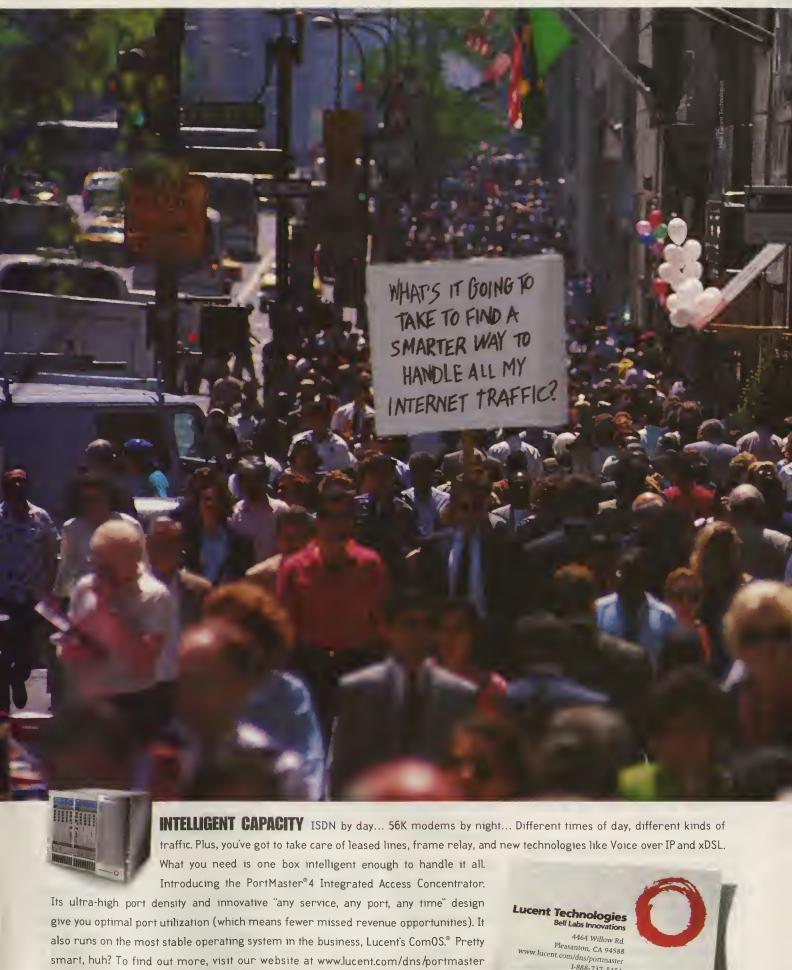
With the DSL distance limitations I'm sure 56k will be around for a while but I would guess the telcos will put up repeaters to handle longer distances after the normal DSL saturation begins to thin out. Plus I've heard rumblings of a few CLECs opening up around Los Angeles - I know UUNET has been offering DSL in my area for a while - but the price was just under most upstream ISPs T-1 rates and I think it's absurd for UUNET to take a great technology like DSL and try to ramp-up the price.

This is a great advancement for the Internet-we're moving into the next phase.

If you like I'll keep you updated on my DSL ventures - it doesn't officially begin until late July.

Best Regards,

Brett



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also runs on the most stable operating system in the business, Lucent's ComOS.® Pretty smart, huh? To find out more, visit our website at www.lucent.com/dns/portmaster or call 1-888-737-5454. We make the things that make communications work.™

There are some curious mathematics concerning connectivity that are important to understand, particularly for ISPs and phone companies. If I take 100,000 people and connect them to me at 384K, what specifically do I connect them TO and at what bandwidth that they might "access the Internet" at 384K. I would be extremely interested in hearing a follow-up from you about August of this year, indicating your true experience in comparing that 384K at \$60 to your current mid-forties at \$20.

And I'll leave it at that for now.

Jack Rickard

### SICK OF WHINERS

Great Magazine, Megabyte Ditto's Blah Blah Blah Etc. Etc. Etc. . .

I just finished reading your "Letters to the Editor" section in the May 98 issue of **Boardwatch** regarding the letter from Lucent and I just have to make a comment.

I am sick and tired of these whiners from Lucent, Rockwell etc. complaining about how unfair your report on how x2 was better then K56flex and how inaccurate your testing methodology was.

You hit the nail on the head when you said, you tested the "real world" way. I don't want to hear test results from a laboratory at 3Com, Rockwell or Lucent because they will all make sure conditions favor THEIR products! I want REAL world test results and that is what you provided!

Yes, I am an ISP and yes, I have 3Com/US Robotics modems so some might think this is a biased comment, but I can tell you this, we have some of the worst phone lines in the nation here in the backwoods of North Carolina and my 3Com Total Control Hub doesn't even burp when my customers try to establish an x2 connection.

The average connect rate is 46,666 with 53k being the highest. Right now as I type this letter, I am looking at the following...x2 customers currently connected...46.6k, 49.3k, 44k, 38.6k, 46.6k, 45.3k and 48k.

I recently upgraded to V.90 as well (which by the way only took 30 minutes

per 46 modems) and the performance is about the same. The V.90 customers are telling me the throughput is better then on x2 and that they achieve higher transfer speeds then their posted connect speed because of the auto adjusting the V.90 is doing based upon line quality.

Sure, you might lose some Rockwell and Lucent advertising dollars but hang in there, redo those modem tests exactly like the whiners want you to and show them sore losers that 3Com really does have the best modems on the market!

Sincerely,
Steve Moody
AlphaTech On-Line
Web - www.a-o.com
E-mail - Support@a-o.com
Phone - 828-687-8848

Steve:

Well, look at this way, they had to say something. I thought it rather resource-ful that they keyed a response based on our test location, under the assumption that would be something difficult for us to change. They had no way of knowing our office lease was up May 31, that we were all sitting on top of each other, and that we had a planned office move to Golden with a different location, different central office, different type of central office switch, different analog lines, etc. already planned.

So it's June, and we're testing again. I can tell you that the tests are coming out very similarly. And I can offer a wager that they will have a different response to our next published test results. But they have to say something.

Jack Rickard

### **BOARDWATCH** ON THE NEWSSTAND

Jack:

First, compliments on your magazine best one published on the subject matter, no question.

Now, I would like to make a few comments about a recent letter (March issue) in which you talked about newsstand, mail, and Internet issues of **Boardwatch Magazine**.

1) You stated that you lost 25 cents on each issue sold at the newsstand. I can

understand that, having published a scientific magazine in college. I should point out, however, that the only way I ever found out about **Boardwatch Magazine** was by picking up a copy in the local Barnes & Noble and reading it. I liked it so much that even though I read the entire issue in the book store, I purchased it anyway. I continued to purchase **Boardwatch** monthly for the next six months or so, planning to subscribe but never getting around to it.

Finally, one day, I could not find the current issue in the bookstore. The manager told me that they had stopped carrying it. I was therefore forced to subscribe. I have subscribed ever since.

My point, however, is that you got me as a subscriber because I saw the magazine on a newsstand. I would have never known about **Boardwatch** if I had not seen it on the newsstand. I pity the poor multitudes that are blissfully unaware of the existence (and importance) of **Boardwatch** and may never find out about it, since their only chance is by seeing it on a newsstand, and their newsstand does not carry it. (I truly wish there were more ways to get out the information that **Boardwatch** is a MUST READ magazine for anybody with any interest at all in the Internet.)

2) On a related point, I note that the Internet issue of **Boardwatch** does not carry the advertisements that are present in the paper edition. Perhaps I am the exception, but I at least glance at every advertisement you have, and I actually read many of them. Believe it or not, I miss the advertisements on the Internet edition of Boardwatch. You might want to look at some method of making the advertisements available online, without using too much bandwidth. Perhaps you could send small icons (low bandwidth requirement) that capture the crux of the advertisements. so that someone who is interest could click on the icon to receive the full image file of the advertisement.

Dean Huffman 46 Brighton Road Springfield, IL 62702-3360

Dean:

All true. We do get many loyal readers that first encounter us on the newsstand. And at the risk of heresy, let me note that I actually view advertisements as an important part of our editorial mix. In a very unusual fashion, we target specific

ISPs



companies, and we apply ad salesmen to them - in some cases for months, to get not only that specific company, but often that specific ad for that specific product, into the magazine. When I look through the book on delivery from the printer, there are many things that I look for, but having an interesting mix of advertisers, offering an interesting mix of products, is one of them and I think that's a somewhat unique editorial view. It has nothing to do with money. It's more of a what would make an interesting and good looking magazine, and why the hell isn't Cisco advertising their 5200 series in here somewhere and what do you ad sales guys do for a living anyway?

In reality, I can't make Cisco do anything. I can't even make them do something that would be good for Cisco. But by approaching it this way, I think we get a better book. In most magazines, the fight is to keep the ad sales from driving the editorial. We wind up with a very different problem, frustrated ad sales guys who don't understand why we don't want an ad for Tupperware or Buicks in our magazine. It would be ugly.

In a fast moving industry addicted to rapid technological change, the ads may be more important than the editorial. I'd like to think not. But it's certainly part of the mix.

Jack Rickard

### THE MOMMY TEST

Jack.

Boardwatch is one of the best magazines around. A couple of years ago when I had trouble getting my PC configured for a connection to the Internet, I ran across your magazine at my local newsstand. I followed your instructions, and I was on the Internet immediately. I was impressed. That is why I took out a three year subscription.

Your mommy test editorial is one of my favorites. I had a chance last winter to give my mommy the test. I spent two weeks with my parents, the most time I have spent with them since I moved out of their house when I was 18. I wanted to be able to exchange e-mail with them, so I brought them a computer, monitor, color printer, modem, etc. Neither of them has ever used a computer before in their lives. So I spent 28 hours showing them how to start it, how to launch the browser, how to do e-mail, and how to use a word processor. I set up a simple Web page for them with links to sites they might find interesting. I took notes during the lessons on points they were having problems with. I printed out the notes in simple, plain English and put them in a notebook. Then I left and came back to my home.

And so what were the results of mommy's (and daddy's) test? They have never returned any of my e-mail because they cannot remember how to use the e-mail program. They do not even know how to download the e-mail I sent them let alone send one to me. And it is impossible to give instructions over the phone. It just won't work. Nor do either one of them remember how to use the word processor.

What do they remember? They can click on a browser icon which automatically dials their ISP and loads their Web page. They can click a link on their Web page to go somewhere else and then hit the back button. They can click on the 'X' to close it. And that is all they can do after 28 hours of one-on-one personal instruction and \$5,000 worth of hardware and software. When you consider how much time and money they spent on raising me for 18 years that is not a lot of money. But it is probably a bit of over-kill just to surf the Web.

Since mommy cannot use the word processor, I set up a Web page for her with just a text area. She can practice her typing and print it out on the printer. This she can do and she enjoys it. But she understands this, it is easy for her, and she does it from a Web page.

The Internet is built on an abstraction: a universal network where all computers are equal, and any computer can communicate with any other computer as long as it knows the address. All of the low level details are hidden like interconnecting between different networks which may use different physical media using different link protocols.

Mommy needs an abstraction too. She doesn't need a computer. What she needs is a communication appliance like the telephone. It needs to have one button she can press to connect to her ISP. It needs to have a screen so she can click on links to surf the Web. It needs to have a small keyboard. She does not need a complicated e-mail client locally on her communication appliance. What she needs is a simple e-mail applet or scripted Web application that is provided by her ISP on a Web page. It gives her access to messages and allows her to send them, but leaves all files on the mail server. She also needs a simple text editor embedded in a Web page so that she can type up letters and print them out on her printer or maybe her ISP will print it out and send a letter for her, but she doesn't need to save any files on her appliance. It would only confuse her. She doesn't need a Baroque application. She needs something from the modern school, where form follows function and less is more. And she needs

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every thing managed from her ISP, her communications utility.

I don't know what the exact figures are, but I think somewhere around 38 percent of American households have a computer. In my opinion the other 62 percent will never have a computer in the house because they do not have any need for one. It is just too damn complicated and geeky. But they just might want one of mommy's communication appliances for about \$250.

I know that there are some consumer electronics devices coming onto the market later this year like set-top boxes and screen phones that connect to the Internet. If one of these products catches on with consumers, ISPs could find their customer base growing rapidly. My question is, do ISPs have the hardware that will scale up quickly and reliably? This new wave of customers will not understand busy signals and servers that are down because they couldn't handle the load.

I have been to ISPCON in 1996 and 1997. I will be in San Jose for 1998. I want to see what ISPs will be doing for mommy when she gets her Web phone.

Best regards, Kelly Gerber

Kelly:

I agree that a vast number of people are never going to use a computer or the Internet. And you are probably correct that a simple appliance might be hugely successful. But I'm not interested in them. I call it the Nintendo effect. Years ago, there was a thriving computer game software industry. Nintendo and Sega developed quite powerful specialized computers, some of them now 64 bit monsters with more horsepower than we use in personal computers, wrote specialized game software for it, and spawned a huge game industry. Interestingly, you can't even find the notch in computer game software sales where this happened. No effect positive or negative.

Similarly, I expect a huge TV set top box industry to spawn from the Internet. But it won't effect ISPs, personal computer sales, or the Internet other than the fact that there will be more clueless people on the network than before. This gives me a good lead in to my network computer diatribe. I have seen, with my own eyes

and ears, late middle age women, who were still unclear as to what the mouse was for, argue somewhat heatedly about who had the most MEGs and who had the most RAMs. No one at any level of use wants anything to do with the WEENY computer.

The mommy test was intended not as an indictment of mothers or motherhood, or to belittle end users of any sort. It was a reality check for ISPs who often bemoan the cluelessness of their customer base. And the message is, go face what THEY face in getting onto the Internet.

Today, it is as applicable as it was a year ago. I recently attended Bob Metcalfe's Vortex98, a private conference discussing convergence of voice, data, etc. Every bigwhig from every major player was on hand to paint a marvelous picture of a future with global IP networking, the revolutionary displacement of local telephone companies, etc. And an underlying theme was that we had made it and that Internet access was now a commodity. Most of my address was to reintroduce the mommy test, and urge all these high level billion dollar executives to go do it once, and THEN explain how they were going to rewire the whole thing.

Bottom line, is I don't think Internet access will necessarily reach appliance stage any time soon. But it shouldn't be as hard for a new person to get on as it STILL VERY MUCH IS. Everyone sneers at AOL, but they mailed 260 million disks out there and got 11 million people online by making it as easy as possible.

Jack Rickard

#### INFO ON BONDING

Hi,

I am looking for information on bonding. I just installed another phone line into my home and I need some help to bond them. I have done a little research. My ISP doesn't support bonding but a couple of people say you can overcome this by getting two ISP accounts and software to connect two modems to one IP.

Any help would be appreciated.

Regards, Paraic McGuiness parmcg@tinet.ie Paraic,

Transcend has a dual modem that bonds two 56 Kbps modems in true fashion, but it requires a Transend modem on each end. Ramp Networks has a box that allows you to plug in up to three modems. It doesn't actually bond them, but you can do multiple IP sessions with each over a different modem. The advantage is, you can not only do this with two accounts from an ISP, you get some advantage even if you have two different accounts with DIFFERENT ISPs at the same time.

MultiTech and 3Com now also have announced dual modem products. A good deal of the country is not served by ISDN, and I think these dual analog modems that combine two 56 Kbps modems into one 112 Kbps channel (ok, ok, two 42 Kbps into one 84 Kbps channel) are actually going to go gangbusters.

Jack Rickard

### WIRELESS ACCESS THE FUTURE?

Dear Jack,

(Insert highest level kudos for magazine [all having been said before] here). I am, without doubt, one of your most devout disciples. You have the uncanny ability to cut thru the BS surrounding an issue like an electric knife thru an overdone turkey. Your wry wit and analytical thinking are a breath of fresh air in the bus-stop restroom of magazine writing. Your analogies are always dead on, but enough sucking up (you really should think about running for office, tho).

I am writing in reference to Amrit Sadani's letter posted in the June Issue. He stated that he experienced reduced connection rates under V.90. I had a similar experience, but now am doing fine.

I was using a USR X2 modem prior to the release of V.90, and getting consistent 49.3 Kbps connect rates. When my ISP upgraded their equipment to V.90 (I believe they have a USR Total Control Hub) they informed the subscribers that connection times for x2 modems would drop until they were flashed to V.90. Sure enough, the day they put V.90 in service, my connection rate dropped to 28.8 Kbps. After finally (but that's another story) getting a replacement V.90 modem from USR, I plugged it in

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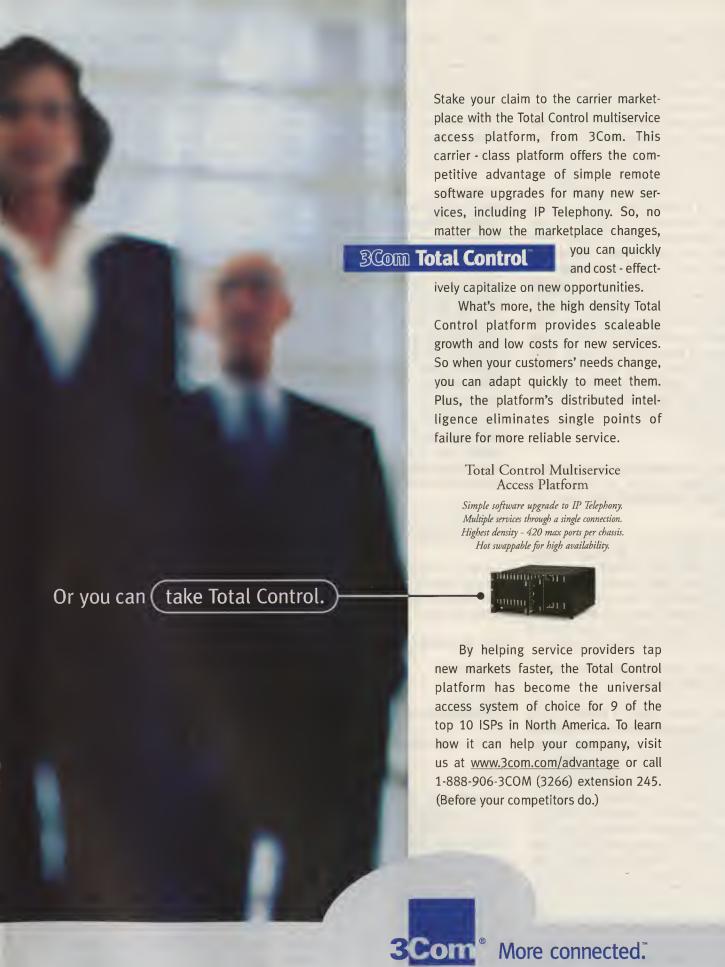
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and dialed up. I use NT 4.0 with dial-up networking, so my connect speed shows up as a Tool Tip under the modem indicator in the system tray. When I connected, the Tool Tip advertised 115,200 bps. Everything seemed to work fine, and downloads maxed out at 6 KB plus. However, on subsequent calls, I have had significant trouble with handshaking. I'll dial up, the modems will talk to each other, then I'll get a message saying there was no answer (nobody's home!... .boy, ain't that the truth). I went to USR to see if there was a new .inf file for the V.90 modems, and sure enough. I reinstalled the modem using the new .inf file, and tried it out. The advertised connect rate was 49,300, and download speeds were similar, but I was still having to dial two or three times to get a connect. Then I found out that the modem server software is still in beta (figures). I guess sooner or later, somebody'll release a "fit for human consumption" version. I did, however, reinstall the modem using the old .inf file, no practical advantage, but the 115,200 connect speed sure does look good when it pops up.

Since I have temporary use of the soapbox, I'd like to offer my uninformed, technically unenlighted view from the bottom.

I firmly believe that small ISP's dealing strictly dial-up are dinosaurs caught napping when the asteroid hit. The only reason they're still around is that all of the big boys are doing the "Who's on First" routine. Sooner or later, one of them is going to get their head out of their you-know-what and do it right.

For doing it right, my money is on the cellular guys (literally).

I firmly believe that the Internet is not going to get beyond this hormone-afflicted adolescence it's in now until everyone, everywhere, can be connected all the time, 25 hours a day, eight days a week. You can't do that with conventional dial-up. The small ISPs can never do it. The large ISPs could do it, but not without incredible amounts of cash outlay. The RBOCs could do it, but if they do, there will always be somebody else doing it, because they breed competition. And there's no way they could handle the tech support. They have the bedside manner of a proctologist, and dealing with either one will leave you with the same feeling in your posterior. That leaves the cell phone guys: They have the infrastructure, they have the installed customer base, and the technology is available. A company called Teligent (www.teligentinc.com) is currently gearing up to offer service in the northern Virginia area. When (not if) it takes off there, it won't be long before you see cellular companies everywhere offering digital wireless phone and Internet service. The advantages are too great to dismiss.

Incidentally, in Steve Stroh's column "Wireless Data Developments", June, he mentioned WaveRider Communications, Inc (www.waverider.com), a company which supplies wireless systems. I understand they are doing rather well in Canada, and they're doing pretty good on the market, but I suspect it won't last very long. They've taken the approach of marketing to ISPs, which is like trying to sell storage sheds to homeless people (it's just what they need, but they can't afford it), small ISPs, and most larger ISPs, don't have the capital required to develop a cellular infrastructure. . .their money's all tied up in fiber and digital phone lines. A new company starting up using WaveRider's technology could compete, but the cell phone guys still have the advantage with infrastructure and customer base.

So I think the cell phone guys are the best looking pony in this race. . .if they can get out of the starting gate.

I could be wrong, however. . .these are just my opinions. . .and I'd really like to hear what you think about the shape of things to come.

Don't go changin'.

Respectfully,

Paul Smith pmith@hroads.net

PS: You really should use more commas...

Paul:

The V.90 story is at this point (early July) a non-story. Everyone claims to have one. USR is about the only one that actually appears to have one. We actually had to revise our dial-up testing because there just wasn't any V.90 deployed on the K56flex side. Now I understand that Rockwell is spinning off their semiconductor business and laying off 3,800 employees. My guess is we've been had and a lot of people have spent a lot of money on what may shape up as a mess.

We did do some testing of the 3Com/ USR V.90 and I'm impressed. It's better than their x2 was in our testing.

Dial-up is a very funny beast. Its demise has been predicted so often, and for so long, that it is virtually a publishing/study industry of its own. Similarly, the telcos, the cable companies, and everyone else have been looming on the horizon with the killer deployment for as long as I've been watching the horizon over 15 years at this point. I think most of the talk about this underestimates the time required to deploy these technologies as well as the thriftiness of the general using public. Finally, when it appears the small, entrepreneurial communications company can't possibly play because of infrastructure disadvantages, we're usually on the cusp of a boom for small entrepreneurial comm companies. I don't know exactly why that is so, but it appears to be ever so.

I am seeing some wireless cellular services springing up at about \$65 per month for 19.2 Kbps wireless links. I think there is a strong market for this, but realistically, it is three times the money for one third the speed - mobility being the upside. It's not going to displace dial-up. In fact, it isn't going to show up on the dial-up curve as even a notch. But it does comprise a very interesting additional access method worthwhile to a certain segment.

I'm currently fascinated by a bit of an inside view into a family of total non-technoids devoid of the knowledge necessary to plug in a toaster. But they're all obsessing on electronic mail. They can hardly continue life while waiting for the next incoming message. They don't know dial-up from Botswana, but they want their e-mail.

Warmest Regards;

Jack Rickard

### VRML VS. VIRTUAL REALITY

[To Thom Stark, regarding his June 1998 column entitled "VRML: Still Not Ready for Prime Time."]

I agree with your re-assessment of VRML, but I have a couple of points:

The VRML spec, based on sending polygon and texture maps was designed by people with fat pipes and big machines. The user has to get the entirety of a



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scene in order to see it. The "Level Of Detail" system doesn't work well, as the smaller/larger files have to be downloaded already, negating any advantage. A much more rational system would have been a "B-Rep" geometry representation with procedural textures. B-Reps are simple geometric solids represented as "trees"; a cube is a "tree" with eight branches (the corners) that connect back to each other. A corner of a cube can be sliced off or "beveled" by "branching" a particular distance from a corner. In this way, a cube can be turned into a smooth sphere by iterative branching. Any complex shape can be formed by a collection of simple shapes, and branching.

Do you see where I'm going? The ideal "VRML" system would send a tiny file with the basic shapes as just a basic form name (cube, cylinder), size, location and rotation. Then the modifications would be "streamed" from the server to the browser as more detail is needed. The detail change could be cached, but the delta is minimal.

If you want to see an example of this method of geometric representation, check out Nichimen's web site for their product N-World: www.nichimen.com/PRODUCT-INFO/3-2/3-2.html.

In the same way, procedural textures, rather than texture maps make much more sense. Simply sending a Render-Man-like "texture: Marble; VeinSize: 2; BaseColor: 255,255,255...etc" makes more sense than sending a bitmap.

But all this is moot. The truth is: everyone is ignoring VRML and it is dying the death it richly deserves because people are already using a "virtual reality" system with a fat client/thin pipe world. It's called "Quake." I don't play games myself, but I've observed that people are interacting with an environment and each other (well....) in an easy to navigate, beautifully light (scaling wonderfully for various hardware) environment with gravity, collision detection, practically everything one could desire.

Load any Quake .wad with the monsters turned off in "deathmatch" mode. What you'll see is better "VRML" than Mark and the gang from SGI has every been able to demo. Try some of the various .wads out there, and you'll see how practically anything one would do with VRML, one can do in Quake. Shift the paradigm a bit and the alien world could be a shopping mall or a gallery.

I agree that a mall isn't necessary, but collecting useful links is the most popular activity on the Web. It's just that no collection of links is worth downloading a huge file when the same info can be contained in a 2K text file.

Death to VRML! Long Live Virtual Reality!

Chris Williams

Chris:

Your points about the architectural shortcomings of VRML are well-taken. And Nichimen and Quake are not the only alternatives that make better architectural sense. Marc De Groot's Meme (tm) is another thin-pipe model and WorldsAway's architecture employs the same kind of client-server approach as does Quake.

The principal problem with all of these approaches is that they just don't solve any real problems for consumers. They're useful for specialists in certain disciplines, (heart surgeons, molecular biologists, etc.), but the only things of value they offer most users are interactive gaming and glorified chatrooms. Neither application is compelling enough to cause the kind of paradigm shift that widespread adoption of a virtual reality interface to the datasphere would require, much less to drive the adoption of VRML as the standard upon which that interface would be based.

Basically, VRML isn't so much a technology as it is a religion. True believers are unshakable in their devotion and, like most religious fanatics, they couldn't care less about what non-believers think. They have faith because they believe and they believe because they have faith, virtual world without end, amen.

Meanwhile, the market is from Missouri. And, games, chat and niche solutions aside, virtual reality has yet to show the market why it should care.

Regards,

Thom Stark
thom@starkrealities.com
www.starkrealities.com
PGP public key:
www.starkrealities.com/
thomskey.txt

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### TRYING TO GET UP TO SPEED

Dear Jack,

My good friend Peter, who subscribes to your publication urged me to write you about my recent experience. He thought you might be interested and also have an idea for a possible solution.

Background: I am a newcomer to the Web (two weeks). My Dell notebook had a 28.8 modem when I purchased it several years ago. I selected the IBM Global Network to be my ISP, primarily because they were the only one which had local access numbers in both areas where I live; Maui, Hawaii & Traverse City, Michigan. After searching around and discovering some of what the Web has to offer, I became a bit impatient with the download speeds I was getting. It would range from 19,200 to something like 21,000+ bps.

The IBM home page is filled with the glowing announcements of x2/56k and V.90 upgrades which are available to over 500 POPs including those where I am (check it out www ibm.net). Armed with a small bit of additional information, supplied by my more computer savvy friend mentioned above, (like V.90 might be better added later because it can slow the performance of the x2/56k modem at present), I went looking for a good quality x2/56k modem that I could upgrade to V.90 at a later date. Naturally, 3Com USR/Megahertz was easy to find and has a good reputation. I paid the \$230 and installed the modem that night. Through the 3Com USR/ Megahertz registration window I was told that they automatically offer an online test on this product immediately when sent. Sure enough back came the news that my x2/56k was running perfectly and fully capable of the FCC authorized speed of 53k.

Well, come to find out not much later that I can only receive 28,800 bps. I called IBM Global Services and was then told that if my phone number and their local access number has more than one analog to digital conversion between them that I would never be able to get more than the 28,800 bps speed I was now getting. I called the IBM nationwide 800 number to try a different route. 26 400 bps was the best I could get there. "Call the phone company," they suggested. Unlikely, but maybe they would reroute my line. They also mentioned that "somewhere in their library it does mention this situation." I

## Open Up...



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called the phone company. They said that much of the phone system in the country won't support this because it was originally intended for voice use only when installed. "Sometimes it works, sometimes it doesn't." They also said they could not reroute my line, but I could spend hundreds of dollars more if I wanted to put in an ISDN line.

I checked the IBM's tech library and indeed this information is buried in there. There is not one word of this anywhere in the 3Com USR/Megahertz printed information (not even under the troubleshooting section) or on the box of the modem. I feel like I have been ripped off. Am I wrong to think that two of the most reputable companies offering service and hardware for Internet access should advise people like me in a more upfront way or is buyer beware always the rule, and let the dust fall where it may?

I know I could choose another ISP and hope that their access line is without the extra conversion or switch to cable, satellite or dedicated phone lines at considerable cost. Living in two locations makes this more expensive and awkward. Other than this situation I do like the IBM ISP system and 28,800 bps is a bit faster than what I was doing on my original modem. But, it is far from the 40,000+ to 53,000 bps ability that I thought I was buying.

I appreciate your taking time to read this and would love to find out if you know any other way to achieve the higher speeds I was striving for, through a regular phone line.

Sincerely,

J.B. Elder Traverse City, Michigan jbelder@ibm.net

JB:

We've made nearly 300,000 calls at this point. The x2 modem, either Courier or Sportster, consistently produced the best results. And as it so happens, IBM was the ISP with the best connect speeds using these modems, and the best call completion rates.

Before doing any other research, I would urge you to review your Win95 settings, particularly with regards to port speed. If you consistently can't get a connection from different locations to different IBM ports, I would look carefully through

your own machine. We have a 6 db pad here in Denver, as many as 3 robbed bits in the long distance paths, and some of these IBM locations just never miss.

Jack Rickard

### LIFE AWAY FROM THE COMPUTER

In your most recent editorial (July 1998, thankfully the LAST issue of Boardwatch that I'll ever receive), you wrote:

"I personally have no interest in the Caymans. Vacations are for the weak minded that never did find anything to do with their life."

You arrogant, fat-assed bastard.

If you'd been stuck laying bricks for a living, you'd think otherwise.

I look forward to the demise of Boardwatch, while knowing that you've already made enough money from it to secure your retirement, and to guarantee the availability of all the Winchell's donuts that you could eat for a lifetime.

Paul Montgomery 5044 Marine Drive #4-B Chicago, IL 60640 Paul@LogonChi.com

Paul:

Interesting reaction from a number of points of view, Actually, my family were brick and stone masons for at least three generations known to me and one cousin claims he's documented seven generations. I DID do a bit of bricklaying and to this day find manual labor both creative and mentally therapeutic. It's what I do for recreation when I'm not "working." Just completed a bit of tile work myself and while the knees aren't what they used to be, I derive great satisfaction from the finished product. And genetically, my body is almost perfectly formed for picking up large rocks. All the weight is up front and in truth, I can barely perch in front of a computer on the little smidgen of backside I have without tipping over sideways.

But it's the "stuck" part of your message that has me going in circles. Nobody is stuck. If the eldest son of seven generations of bricklayers can cavalierly go off into life and do anything he wants, and I did, I have to assume you can as well. That is, unless of course you are just among the weak minded and never did do anything with your life that YOU felt was worthwhile.

You don't need a vacation in the Caymans either Paul. There are two other paths open to you. Learn to take joy in the work you do by doing a lot of it and getting very good at it, or drop the trowel to the board now and walk away to do something you DO want to do. Then do a lot of THAT until you get very good at it. There's a year or so of starting over but the economic realities are not quite what you imagine. You're only stuck in your own mind.

I don't eat donuts. But I just LOVE Chex mix.

Jack Rickard

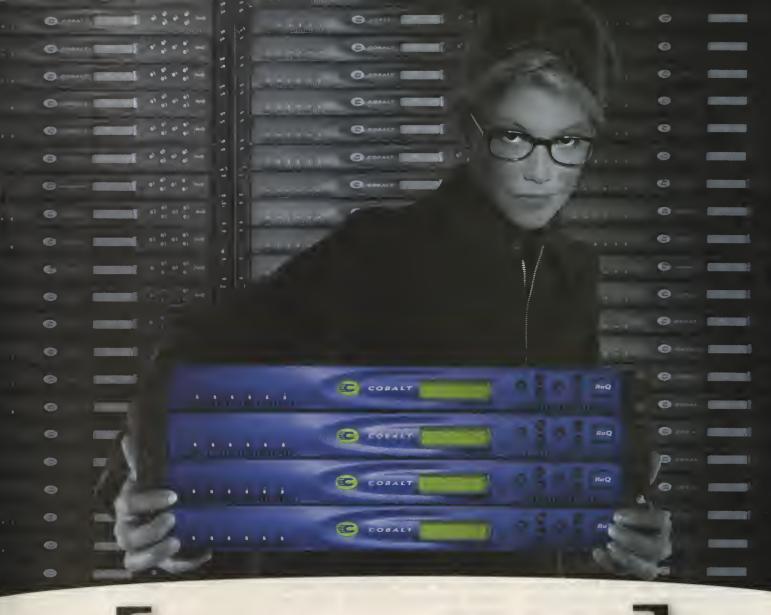
### AN ISP MAILING LIST

Hello Jack,

Great magazine, I've been reading it religiously for about five years now.

I have started a mailing list for ISP owners that could be of great value to ISP owners. The ISP conventions are a very valuable resource, but at the same time, I see no reason why ISP owners shouldn't interact with each other on a daily basis. Any ISP owner interested is welcome to join the list by writing to isp-re quest@chatnet.com with the word 'subscribe' in the subject line. The focus of the list is intended to be an open forum for ideas within the ISP community. If the list is successful, as I expect it to be, we will also host a companion Web site with information and an archive of the messages from the list.

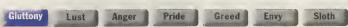
The list is open, but it will be moderated and anyone 'spamming' the list will be removed. I would hope that the list will become a valuable resource to those that run ISPs. As an owner of eSoft's IPAD, I have been fortunate enough to belong to a similar list for those of us who run an IPAD. It has proven its value time and time again, and I would like to see that extended further into the ISP community. I apologize for using your magazine to advertise this list, but I also think it will be of great service to those that belong to the list. I would feel privileged to have you as a member as well, and your presence would be a boon to those of us with vision.



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Jeff Luehrs
President
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jluehrs@chatnet.com

Jeff:

No need for an apology. We exist to bring resources to ISPs. In recent years, I've found most mailing lists of better quality than newsgroups. I myself like ISP-CEO (mailto://join-isp-ceo@isp-ceo.com) and ISP-MARKETING (mailto://join-isp-marketing@isp-marketing.com). I also enjoy provedores-brasil@listas.visual net.com.br. It's all in Portuguese so I have no idea what they're saying most of the time. But it's interesting to see how many ISPs are in Brazil.

Jack Rickard

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First let me say keep up the good work. Read your magazine for a long time and my subscription's good thru December 2000 (so hopefully your marketing dept will leave me alone for a LITTLE while at least<grin>).

Enter US West and their offer of ISDN. After much waiting I finally have a scheduled installation date. I take the day off work. . . I wait patiently at home (are you sure when they were cloning sheep they didn't clone all the cable guys as well?). Phone rings (at NOON on the installation day). . .woops, sorry, technical difficulties, installation pushed back two weeks. Grrr. . . ok, live and learn. . . eventually ISDN was installed with much rejoicing and surfing. Fast forward six months, DSL now available, installation costs waived, you already got ISDN so your loop test passes with flying colors. . .installation should be a snap, right? Only three weeks for my installation date...the morning of the installation (another day off of work) and 'RING!" we're sorry, due to technical difficulties...blah blah blah, rescheduled for eight WEEKS later.

Also at the time of signup my current provider hadn't yet been able to setup with US West (though I KNOW they have been trying), so conveniently I had to use US West as my provider. The costs appear reasonable. . .but call me gunshy. I feel like Wile E. Coyote about to strike a match in this dark tunnel to find out where I'm at. . .

What do ya think my odds are of collecting if I bill US West for two days employment? :-D

Stay tuned for further developments on July 21 (next scheduled install date for this wonderful 512K line).

Todd Potter
Salt Lake City
pottert@PooterMan.com
www.PooterMan.com

Todd:

Your odds are probably poor and your frustration obviously high. But you do demonstrate a demand for higher bandwidth that is most interesting.

Whenever dabbling at the leading edge, there are frustrations and delays. But while it is more comfortable using proven technology, it's not nearly as much juice.

Good luck on your quest.

Jack Rickard

**GTE'S CABLE MODEMS** 

I recently wrote in about GTE's cable modem service. I have bad news. . . and more bad news. First, their service is still the same - slow as ever (see the June 1998 issue). Second, I'd like to clarify a few things about their service that you (the editor) commented on in that issue. The performance was indeed by design. They designed their service around the use of the LANCity modem, which actually has a BIOS. It can detect a bootp/tftp server on the LAN its on and download config files for itself. GTE makes these configuration files limit the modem. It's a hard limit, based on the tier of service (56 kilobit, 64 kilobit, or 128 Kbps). Second, there is a very good

reason why GTE's system can't "afford" to give people a decent amount of cable bandwidth. You commented on the Internet only being able to be "cut" so many times. Well, @Home and other services like Road Runner have found a way around this. They implement extremely fast internal network (ATM, in @Home's network) and use cache servers to deliver often-requested files and content. This way, the "typical" user gets his data piped in at ultra-fast speeds, and the rest of the Internet is much faster than usual. In the end, every one, including the ISP, the typical customer, and the power using customer is happy.

By the way, GTE's network is supposedly fiber optical - hybrid fiber/coax, to be exact. Fiber trunks (if that's what the cable coax is called) and coax going from the little box on your street to your house. It's a great system, but some people just don't exploit it to its fullest. It's a shame.

Mike Hughes wxh@altonet.com Thousand Oaks, California

Mike:

You leave me breathless. If it's so good, why is it so bad?

Jack Rickard

\*\*\*



Service Level reporting heats up HP Firehunter!

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### CYCLADES ROLLS OUT ROUTER EXPANSION



Router manufacturer Cyclades (www.cyclades.com) has released a new expansion card for its PR3000 router. With this new product, the Z-Bus Interface Card and external Serial Expander boxes, the PR3000 can perform the functions of a router as well as a terminal server.

The Cyclades-PR3000/Terminal Server (PR3000/TS) is for users looking for small to high density of serial ports hooked onto the Ethernet for remote access. The company says its product is cost-effective and can boost the performance, reliability and functionality of a terminal server.

The PR3000/TS connects to the LAN using a built-in Ethernet interface and provides up to 64 RS-232 serial ports (in modules of 16 ports) that can be used to provide reliable remote access (with a modem bank) or to control local printers and terminals connected to multi-user host systems. All the serial ports support speeds up to 921 Kbps and can sustain simultaneous throughput to get the maximum performance of modems or other serial devices.

Cyclades says its hardware uses microprocessor technology, eliminating performance bottlenecks found in other products. The PR3000 is equipped with a 50-MIPS PowerPC CPU in dual-processor architecture (MPC860).

Besides the LAN and dial-up interfaces, the PR3000/TS can support up to two additional WAN ports (configurable as V.35, RS-232, X.21, T-1 or E-1 with internal DSU/CSU, and ISDN BRI). It also has full routing capabilities including support for RIP and OSPF.

According to Cyclades, an ISP can simply connect its phone lines though a modem bank, plug a WAN link directly into the PR3000 and use it as a point-of-presence (POP) without separate routers, DSU/CSU, terminal adapters, Ethernet switches/hubs, servers or any other equipment.

Cyclades bases its pricing plan for end users on the number of ports needed. For 16 ports, the PR3000/TS-costs \$2919 USD; for 32 ports \$3791; for 48 ports \$4861; for 64 ports \$5733.

The Fremont, California-based Cyclades manufactures connectivity products, multiport serial cards, routers, communication adapters and remote access servers.

### **BSDI FILTER BLOCKS, TAGS SUSPECTED SPAM**

On top of annoying an ISP's customers to no end, unsolicited e-mail messages consume disk space, CPU time and network bandwidth, as well as pecking away at employee productivity. Workers must waste time reading and deleting spam, while system managers spend sizable chunks of their work week answering irate spam-related questions.

There's a new technological weapon in the war against spam. Berkeley Software Design, Inc. (BSDI) says it has a software filter based on SMTP standards. The company claims that its BSDI MailFilter works with any e-mail, setting up on servers and desktops with plug-and-play effortlessness.

With patent pending, BSDI's "intelligent filtering technology" spots spammers' signatures and blocks or tags suspect e-mail. By combining traditional database filters with "intelligent recognition technology," BSDI MailFilter analyzes e-mail traffic for tell-tale spammer signs like bad addresses, fraudulent headers, and improbable paths. Company testing indicates intelligent recognition with database technology stops 90 to 95 percent of unwanted e-mail.

To help its customers keep an edge, BSDI offers automatic updates to protect users against future spam and spamming techniques.

BSDI MailFilter provides customization for filtering or blocking e-mails. Administrators can tag mail that should be rejected outright, so that users can inspect it before deletion. A site can override filter behavior to accept or reject e-mail based on the mail's address fields.

The BSDI MailFilter comes in three models: small, which handles up to 1,500 e-mail messages an hour for \$1,395; medium, which handles up to 10,000 e-mail messages an hour for \$4,995; and large, which handles up to 25,000 e-mail messages an hour for \$8,995. Software updates are priced seperately.

Based in Colorado Springs, BSDI (www.bsdi.com) markets its servers and applications to the ISP industry.

### PANAMSAT HOSTS TESTING OF HDTV

High definition television (HDTV) was tested over satellite links at a Napa Valley technology conference mid-July. During the two-day forum, HDTV vendors conducted tests of their HDTV systems using PanAmSat's Napa teleport to its PAS-2 Pacific Ocean Region satellite.

Broadcasters and programmers viewing the HDTV demonstrations included CBS, Disney, HBO, NBC, Sony Pictures Entertainment, Turner Broadcasting, Univision and Viacom. These companies turned out to discuss the practical implementation of HDTV and to observe various HDTV businesses compete with their product lines.

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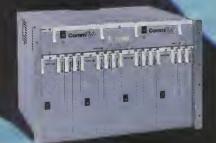
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"PanAmSat is creating an important forum for broadcasters to see HDTV in action, scrutinize system options and implement their HDTV plans under the U.S. deadlines set by the Federal Communications Commission," said David P. Berman, a senior vice president for program distribution.

With the bandwidth-rich digital HDTV format delivered most probably over satellite links, PanAmSat was in part courting its most obvious future clientele. The streaming media applications of satellite-delivered HDTV for ISPs have yet to be developed. "Due to the extremely rich bandwidth needed for HDTV, an ISP could use the service over asymmetrical digital subscriber lines of coaxial cable," said Mike Demko, a senior engineer at PanAmSat. "This would take a lot of content to pass on to an IP domain."

HDTV vendors conducting system demonstrations were: Mitsubishi-Tektronix, NDS, NEC, Sony, Tiernan and Thompson. Each demo began with high definition source material at 1.5 Gbps. Using the vendor's HDTV system, the material was encoded into a post production quality video signal at 45 Mbps or distribution-quality video signal at 19.3 Mbps.

The video was then uplinked from the Napa facility to Pan-AmSat's PAS-2 satellite in either the 1080I or 720P high definition formats. The satellite transmissions complied with MPEG-2/DVB, the latest international video standard for compressed digital video services.

The HDTV satellite transmissions were accessed again at Napa, demodulated and decoded into HDTV format using the vendor's integrated receiver/decoder and displayed on a high definition television monitor. PanAmSat also provided a bit error rate analysis to measure HDTV transmission quality.

Demko declined to provide any specific information about which vendor or products performed better, but he did talk about general trends. When decoding demodulated signals, vendors found that the lower the power and higher the bit error rate, the more unlikely it was for a demodulator to lock on a transmission.

Demko said that in a real life situation, lower power would mean heavier than average rainfall in a given region blocking a signal. "And this would only be a problem with KU band degredation. A robust C band signal would have no problems."

### WHITE PINE RELEASES VIDEOCONFERENCING PACKAGE

White Pine Software (www.wpine.com) unveiled a desktop videoconferencing service that is now available to an allied ISP's clientele. Access provider NOL is integrating White Pine technology into its new value-added Vmeeting service.

NOL leases IP-based virtual conference rooms for business meetings, remote classroom and training courses. NOL's operates a multipoint conference server on their network and manages logistics such as conference and class setup, user registration, etc.

To participate in hosted meetings, customers use White Pine's CU-SeeMe software or another company that sells software compatible with the H.323 voice and video standard, especially Intel Proshare or Microsoft. NetMeeting. NOL provides inte-



gration services to outfit its customers with an appropriate product. They also resell White Pine's MeetingPoint and Class-Point products to sites that want to host conference servers on their own networks..

White Pine develops, markets and supports multi-platform browser-based internetworking software that facilitates worldwide video and audio communication and data collaboration across the Internet, intranets, virtual private networks that use the Internet protocol.

### **UNCLE SAM CUTS FIRST E-CHECK**

The U.S. Treasury issued its first electronic check over the Internet. The government is testing an e-commerce system (www.e-check.org) designed by a half dozen companies. For this market trial, high powered cryptographic technology was used to encrypt e-mail messages carrying e-checks between the Treasury and payees such as GTE Internetworking, and between the payees and their banks.

This transaction was the result of a collaborative three year study by the Financial Services Technology Consortium (FSTC). Participating company RDM said the results were a secure, trusted and verifiable payment option for the marketplace.

The first e-check payment was issued by the U.S. Treasury to GTE Internetworking in payment of a government contract. The US Treasury used RDM software to create, sign, encrypt and e-mail the e-check to GTE Internetworking.

GTE used RDM software to receive, decrypt, view, authenticate, endorse, encrypt and transmit the e-check by e-mail to BankBoston for deposit. RDM said easy connection to the banking community's existing internal check processing systems was a critical design objective.

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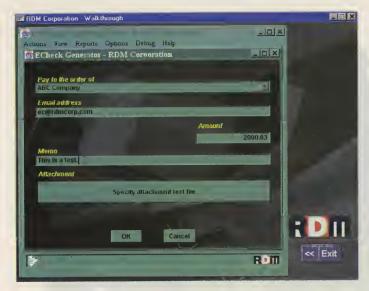
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At BankBoston and NationsBank, an e-check bank server developed by IBM received the e-mailed e-check deposits, provided signature verification and converted the data for internal processing. IntraNet of Newton, Massachusetts, developed software used by the banks to map the e-checks into a standard electronic cash letter format for electronic presentment to the Federal Reserve Bank of Boston.

At the Federal Reserve this transmission was received and processed by a server developed by Sun Microsystems. This server again performed signature verification before transferring the funds to conclude the payment transaction.

GTE, an FSTC member, is the first contractor in the year-long market trial to receive an e-check from the U.S. Treasury. Approximately 50 government contractors are expected to participate in the market trial by year's end. A full-scale rollout is expected by the year 2000.

As a key contributor to the Electronic Check market trial, GTE provided the security infrastructure through the use of CyberTrust Certification Authority and CyberTrust SafeKeyper.

RDM software interfaced with GTE's CyberTrust SafeKeyper at the U.S. Treasury to digitally sign e-checks. IRE of Baltimore, Maryland provided the smartcard technology used by the payee to endorse the e-checks and sign the deposit slip.

"We're working with RDM and others to move this technology as quickly as possible to the business community," added Chuck Wade, an official with GTE. "As a representative of the business community, GTE believes this technology will be embraced by other businesses."

To provide users with an option to encrypt transactions sent over the Internet, effectively sealing them in a digital envelope, RDM integrated advanced encryption software developed by Certicom of San Mateo, California. For the market trial, Certicom's software, based on elliptic curve cryptography (ECC), was used to encrypt the e-mail messages carrying e-checks between the Treasury and payees.

RDM licensed Certicom's cryptographic toolkit, Security Builder, to effect this capability. Certicom is a leading provider of cryptographic security for computing and communications companies.

### SPANISH SEARCH ENGINE GETS MAKEOVER AS PORTAL

In the ongoing foot race for the starting page market, YUPI Internet (www.yupi.com), a Spanish search engine in Latin America, is preparing itself to make the transition to becoming a World Wide Web entry or "portal" site.

Beginning in August, YUPI users will be able to customize their Web starting page in order to have easy access to the best Spanish content and tools available anywhere.

"The main focus is on ease-of-use." Said Oscar Coen, VP for new business development for YUPI. "Our aim is to provide an entertaining, user-friendly environment for the Latin American market, where everything the typical user needs is just one click away from the starting page."

In the emerging Latin American Internet market, where triple-digit growth rates are the norm, YUPI's quest for simplicity has paid off. According to the company, the site's monthly page views have increased exponentially since its inception and show no signs of slowing down.



"Like the bigger players in the American market, we plan on becoming the starting point for Latin America," said Coen. "We've got a firm foothold in our market and we're growing right along with it."

Founded in 1997, YUPI, Inc. is an Internet company offering Hispanic and Chicano consumers a Spanish language portal and

proprietary search engine with the world's largest collection of indexed and categorized pages in Spanish.

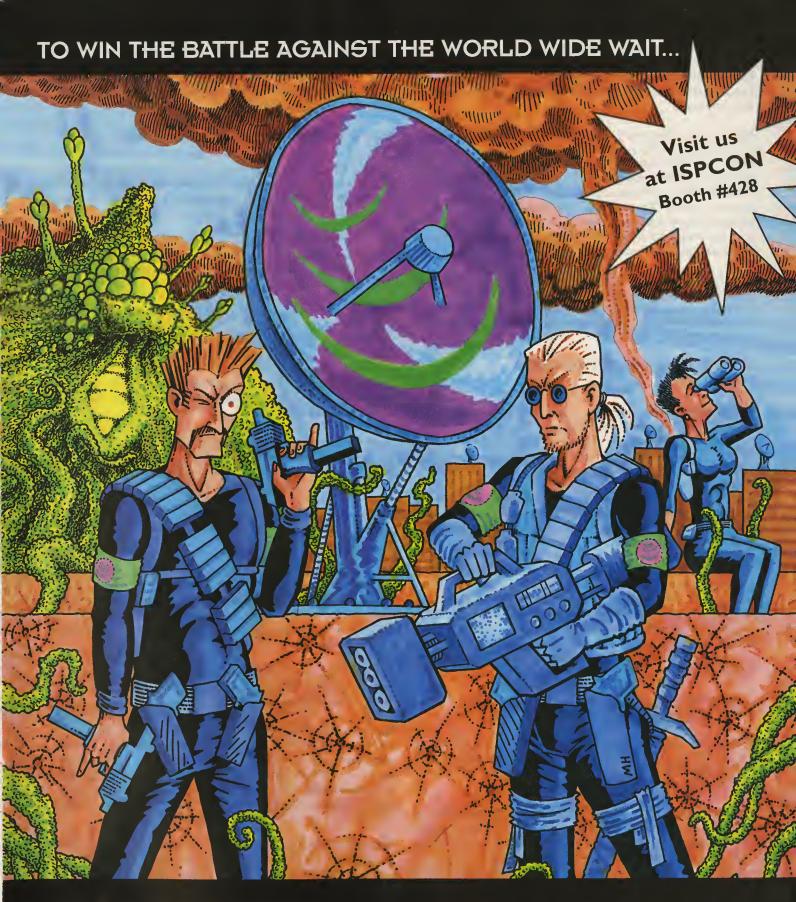
### BELLSOUTH DEBUTS NEW BUSINESS E-MAIL SERVICE

Regional Bell Operating Center Bell South (www.bell south.com) has introduced its new scaleable business e-mail suite. According to the company, its BellSouth.net Business Email Service reduces the needs for sufficient technical resources and maintenance.

Bell South says its new product also allows customers to use their company's own Domain Name as part of their e-mail addresses (jane@your\_company.com) and build company and brand awareness.

With e-mail currently the most widely used application on the Internet, Bell South plans to offer system support and monitoring, which translates to support and maintenance of e-mail servers 24 hours a day, seven days a week.

Spamming and anti-relay controls are also included to reduce unsolicited e-mail and alleviate potential network overload. BellSouth.net Business E-mail Service will expand to match a company's growth. The system can be implemented quickly, with an installation of up to 500 accounts usually completed within 48 hours.



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BellSouth.net Business E-mail Service allows customers to set up, delete or modify e-mail accounts as well as change passwords and auto-reply messages as needed. By utilizing the Web-based administration tool - a menu-driven application customers can maintain access to and control of their e-mail accounts around the clock from anywhere they can access the Internet. Since companies vary in size and staff needs, users have the option for 3 MB or 6 MB mailbox sizes to accommodate both light and heavy users at \$4 to \$6 per mailbox.

To help reduce administrative scut work, users can activate auto-reply messaging and return a standard response to an incoming e-mail message. For example, users can post a standard message to incoming e-mail while away on vacation or business.

### **BROWSESAFE SCREENS WEB SITES** BY COMMITTEE

BrowseSafe(www.browsesafe.com), an Indianapolis-based Web software company, recently touted its new Web browser PlanetGood as, "The first truly safe method of allowing kids to surf the Internet ... giving parents the freedom to choose what their children can and cannot access."

Web sites are continuously monitored, approved or rejected by a board of parents and educators. BrowseSafe says its committee represents, "the interests of families and children, and (those) who espouse traditional American values."

PlanetGood is a customizable Internet browser. The company offers families three modes of Web browsing for kids, teens and parents. PlanetWow! is designed for kids 10 and under and features on-screen instruction and access to games, activities and information especially for children. PlanetCool! is tailored for teens, ages 11-16 and offers graphics, a focus on teen issues and access to a higher level of intellectual content. PlanetHome! targets adults. .

Any Web site that the committee deems objectionable would be blocked in all three PlanetGood browsers.

Should the user come across a site which has yet to be screened, they are prompted to e-mail a request for the site to be reviewed directly by BrowseSafe who then guarantee to scrutinize the site within one working day.

BrowseSafe judges every site and labels the following topics and locations verboten: all newsgroups and chat rooms and any Web sites featuring illegal drug use, gambling, hatred or racial bias, pirated software, pornography, profanity, the satanic or occult, practical instructions for violence (terrorist bomb making) or celebrations of violence (blood and gore).

Founded in the summer of 1997, BrowseSafe claims that it does not believe in government censorship or involuntary restrictions of any kind. As for pricing, ISPs charge customers \$5 a month for the software and keep \$2.

"The company's browsing products are an alternative for parents who wish to make access on the Web limited for their own family, "said one official press release.

BrowseSafe markets PlanetGood to retailers and as an optional service available from ISPs.

### ISRAELI E-MAIL PAGER HITS U.S. MARKET

An Israeli firm has introduced to the U.S. market an e-mail notification service that tips off customers when they receive incoming messages. The hook: users don't have to sit at a computer and sign on to find out about new e-mail.

The Herzilya, Israel-based New E-Mail Communications Systems (NECS) has allied with American access provider Internet Telephony Group (ITG) to market its e-mail notification, confirmation and filtering software.

The software is free; the service is not. According to NECS, almost eight percent of Israeli Internet users pay \$100 per year to use MailPush (www.mailpush.com). Company officials said they expect a similar pricing in the U.S. market.

"MailPush notifies clients automatically whenever a new email arrives in their mailbox," said Zvika Eadan, managing director at NECS.

"And the service is not limited to only a few Internet or e-mail service providers. MailPush monitors the mailbox of our clients no matter who the ISP is as long as the ISP uses the POP3 protocol," Eadan said.

POP3, a standard e-mail protocol, is used by approximately 90 percent of Internet Service Providers in the world.

When an e-mail arrives in a MailPush client's in-box, the MailPush software forwards a notification to an NECS operations center in Israel. NECS then forwards an e-mail prompt and notification to its client's pager, phone or fax. Users can call a special toll-free number to receive e-mail notifications 24 hours a day. Eadan said most MailPush users are notified within 10 minutes.

Besides alerting the recipient, MailPush also sends a confirmation e-mail to the senders, even if they are not MailPush clients. The confirmation tells senders when the recipient was notified. The MailPush computer can call users on their cell, home or office phone and announce a new e-mail, the senders' name and also read the subject line. After receiving the message, users can instruct MailPush to send the entire e-mail text to any fax machine in about 20 countries. All telephone communications are conveyed confidentially through text-tospeech messaging technology. MailPush can also be instructed to always send e-mail to a fax machine.

"E-mail today is like a telephone without a ringer. Millions of e-mail users are forced to dial their service providers throughout the day to see if an e-mail has arrived," said Marc Schechtman, president of ITG. "The message is in your mailbox, but you don't know about it until you dial in and look. MailPush makes e-mail more convenient."

Eadan suggests that MailPush also makes e-mail more mobile, suited for business travelers with remote access to their company account or LAN.

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ITG hopes to market to North American marketingmusers by offering MailPush services for a month free. ITG is also working with long distance telephone companies who will provide MailPush at no charge to their clients.

To keep their service from becoming too intrusive, MailPush offers a smart filter that lets users limit notifications by time of day, sender, subject and notification methods. All selections and MailPush instructions can be changed at the company's Web site. MailPush will also send notifications to the computer screen of any Windows or NT user, even when the user is not connected to the Internet.

### ZIGGY STARDUST IN ISP SPACE

Using a famous person's name and face to name brand a product is nothing new. Marketers have used the technique to successfully peddle clothing lines, fragrances, theme restaurants and even pasta sauce.

Now celebrity name-branding has caught up with Internet access. Starting September 1, UltraStar Internet Services will trot out BowieNet (www.david bowie.com), an ISP dedicated to all things David Bowie.

Labeling the effort as the first "boutique" or "artist controlled" ISP, Bowie Net hopes to build momentum from a "Best of David Bowie" CD release in late August. The Bowie Web site promises a service that will be part fan club, part memorabilia museum, part gift shop and part Internet access.

Using backbone provider Concentric's 2000-plus points of presence, Bowie-Net will offer users Stardust-flavored home pages, news groups, shareware, multi-player gaming and other fan perks. Bowiephiles will have chat

room access to the object of their affection, as well as Bowie wallpapers and streaming media access to previously unreleased audio tracks, videos and photos.

As one official press release enthuses, there will be, "thousands of album reviews, concert reviews and music articles...BowieNet promises numerous cybercasts (both live and archived) from Bowie as well as other artists."

NOC control to Major Tom! This may sound like marketing overkill to some. But Robert Goodale, one of the princi-

pals at UltraStar, says Bowie.Net is just the beginning in a whole line of namebranded celebrity ISPs.

"We're looking for things that constitute strong attractions, rock stars, sports heroes and teams. The goal is to find breadth, depth and common interest that will draw people online. The bigger the category and fan base, the more it makes sense," Goodale said.

While narrow niche marketing for DaBulls.Net or TigerWood'sInternet may be in the distant future, UltraStar promises, "major entertainment, sports and fashion clients in a community based forum delivered over the Web."

For its part, BowieNet will offer users 5 MB of space for Web pages at no charge, as well as Web hosting and connections to T-1 speeds.

Clients will pay \$19.95 for access. For users wishing to remain with their current provider, access to davidbowie.com can be obtained for \$5.95 a month. Fans who vote for full service will receive a CD-ROM to configure their PCs with a customized Bowie browser.

Although Bowie was supposedly reportedly involved putting his creative stamp on his eponymous service, when called for comments, Bowie's publicist said that, "He is currently filming and is completely immersed in the role."

Concentric will deliver BowieNet to 48 countries by the end of 1998. ◆



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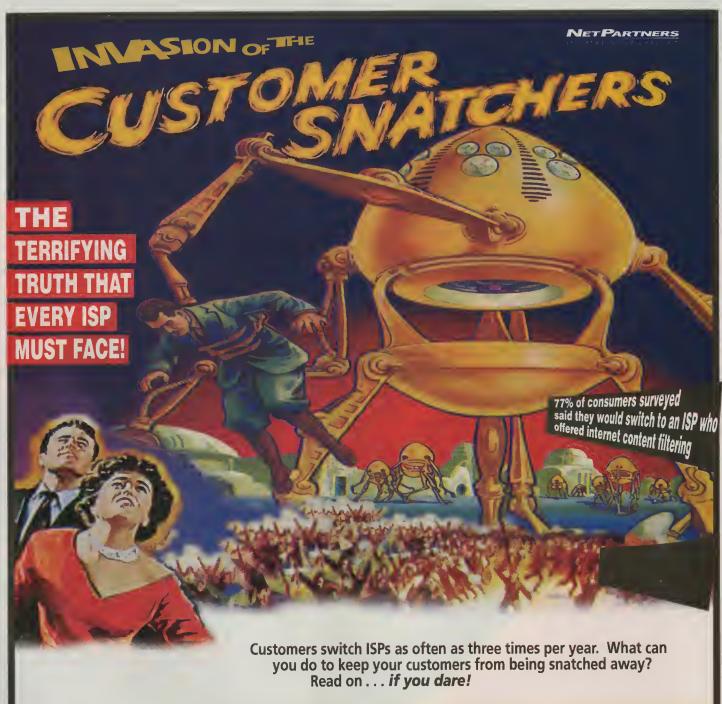
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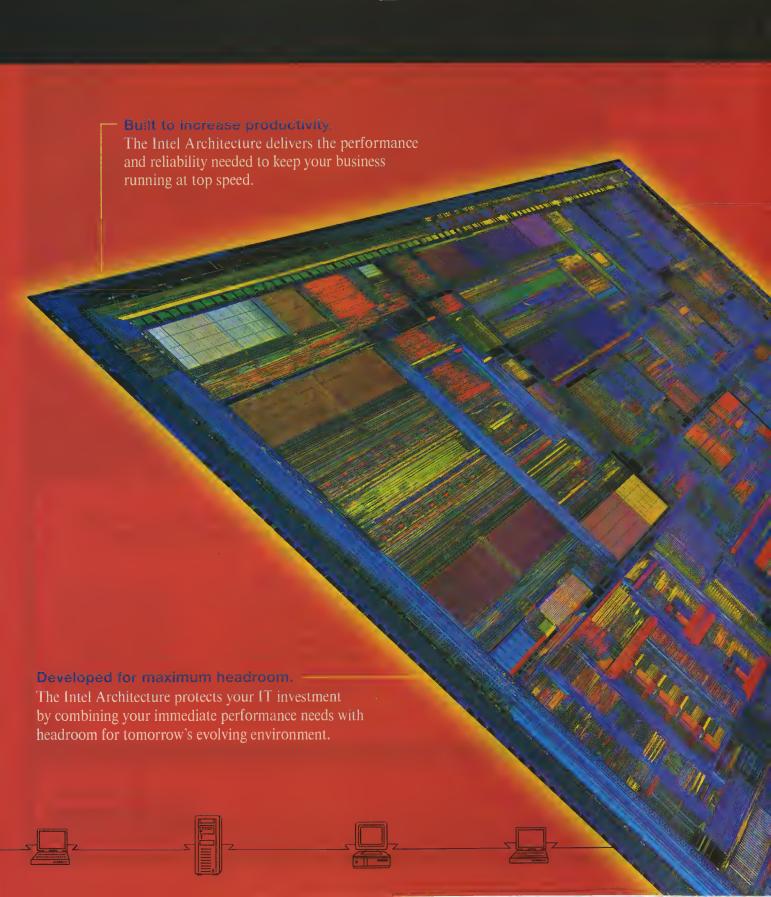
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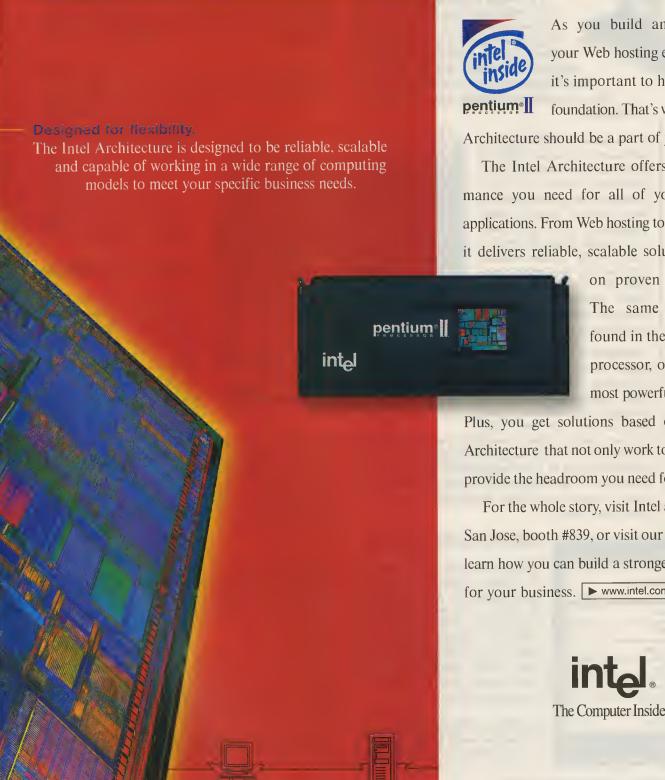
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# TECHNOLOGY FRONT by Jim Thompson Western News Serv

Western News Service

#### PHOTOSHOP 5.0 - A GREAT TOOL GETS EVEN BETTER

Then it comes to working with photos and other images, there is no better tool than Photoshop from Adobe Systems Inc. I almost can't image creating Web pages without this powerful and sophisticated image editing and manipulation tool. The latest ver-

ed features.

sion of Photoshop (5.0) continues its tradition of excellence and adds some long request-

To be honest, I often pass on software upgrades. This is especially true when I have something that is not only working, but is bug-free and does most of what I need. Photoshop 5.0 is an exception, it adds a host of new features which include editable text layers, spot-color channels, a history palette and vastly improved color management and text manipulation functions.

"Customer input has played a major role in shaping the Photoshop 5.0 release," said John Leddy, Photoshop group manager. "In addition to answering our customer's top

requests, we've added a wealth of powerful features that address the full range of Photoshop uses - from color correction to photo-composition and from print production to Web design. Users will gain more freedom to experiment, more predictable results, and more saved time."

Adobe Photoshop 5.0

**MULTIPLE UNDO FEATURE** 

For me the best new feature is the History Palette. It allows for experimentation without the fear of losing past work. With the older version of Photoshop, I was constantly saving various versions of a project just to be sure that I could return to one that was, perhaps, close to what I was trying to achieve.

The History Palette displays a list of changes made to an image. By simply clicking on a step listed in

the History Palette, you can return the image to that state. You can also drag a slider bar to progress interactively through the previous states of the document. The number of undo steps is limited only by the amount of scratch-disk space available.

It is so easy to use and so convenient that it actually encourages you to experiment. You can capture various versions of an image within a single work session

> into snapshots. Combining this with the newly added History Brush tool, you can paint the contents of a snapshot or previous version into the current image allowing you to combine different versions of the same image. This one feature alone is worth the price of the upgrade.

#### IMPROVED TEXT EDITING

Greatly improved text tools allow far greater text-manipulation within Photoshop. In version 5.0 when you enter text using the type tool, a special type layer is created. This type layer tracks text and formatting information so you can easily change the text. A number of new text format-

ting controls allow for the easy creation of high-quality typography including character-level formatting such as tracking, kerning, leading and baseline shift. Multiple fonts can be used on an individual layer and multiple attributes can be applied to any character. Text is created in separate layers, so it is fully editable at all times.

A vertical type tool has also been added making it simple to create vertical text within your image. The vertical text tool joins the horizontal type tool allowing for support of double-byte characters (Kanji) such as Chinese and Japanese.

#### **NEW TOOLS**

New selection and management tools have also been added to Photoshop 5. Among these is the Magnetic Lasso - a tool that combines the speed and ease of the Magic Wand with the exacting control of the lasso tool when selecting a portion of an image for manipulation. Dragging the Magnetic Lasso tool automatically locates contrasting image areas and hugs the edges to



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define the selection area. The new tool makes separating a foreground image from its background easier than ever. If you have ever struggled to select a portion of an image, you will agree that this new tool is a spectacular new addition.

The Magnetic Pen operates much like the Magnetic Lasso. The tool finds and snaps to the edges of an image as it is dragged. Instead of selecting the area, it produces a bezier path that conforms to the edges of the image allowing you to create and apply clipping paths to images and then export them for use in illustration or page layout programs. The Freeform Pen (which is based on the Freeform Pen tool in Adobe Illustrator) lets you draw bezier paths easily.

Color Samplers provide feedback on color values in up to four locations within an image. The color samplers can simultaneously report a precise analysis of the color values in those locations in the Info palette.

#### IMPROVED COLOR MANAGEMENT

The whole arena of color management has been addressed and vastly improved within Photoshop 5.0. Most importantly, Adobe has addressed the control over how the colors on the screen match printed

colors. The simple fact is that not all devices (monitors, scanners, printers, etc.) produce exactly the same colors. For example, RGB monitors can display bright, fully saturated hues that cannot be matched by printers. Printing presses, which rely on a CMYK model, can produce colors that cannot be matched on a computer monitor. To make it more complex, no two devices in the same category (for example, two monitors) reproduce colors in exactly the same way.

A Color Management System (CMS) is used to reconcile these differences in color output. In addition to its proprietary Color Management System, Photoshop 5.0 adds support for industry-standard ICC (International Color Consortium) profiles. Photoshop 5.0 reads ICC profiles when files are opened and saves these profiles. The profiles are embedded into the files so they cannot be separated from the image.

A Gamma Control Panel allows you to accurately calibrate a monitor for consistent color and then output an ICC profile that describes the monitor's color space.

Spot-color Channels let you specify spot-color changes for any image allowing you to incorporate varnishes, metallic inks and other specialty colors into print jobs. Support for 16-bit channels allow for support of 48- and 64-bit color.

#### THREE-DIMENSIONAL EDITING

An intriguing new feature is the ability to select a threedimensional object within a two-dimensional image and manipulate it in three dimensions. By using the 3D Transform Plug-in (included) you can adjust the size, position and orientation of 3D objects. For example, you can draw around an object and Photoshop will simulate it as if it were a 3D object based on the center point. The size, position and orientation of the object can then be adjusted.

The 3D Transform Plug-in is an example of the new Automation Plug-ins available in the new version. The Automation Plug-ins function much like the traditional plug-in architecture of Photoshop but they don't provide completely new functionality. Instead, they automate complex routines using existing Photoshop features. They could act as wizards that guide one through a sequence of steps or they can combine multiple steps into one simple step or operation. A number of Automation Plug-ins ship with Photoshop 5.

The professional photographer will like the new Digital Watermark feature. This provides the ability to embed an invisible, digital copyright signature into an image. Photoshop can detect and display this watermark even after the images is printed and scanned.

Web publishers will appreciate the support for GIF89a, PNG, Progressive JPEG, and Adobe Portable Document Format (PDF). There is also support for EPS, Kodak Photo CD, TIF, JPEG, Scitex CT, DCS, PCX, BMP, PIXAR, PixelPaint, Mac-Paint, Raw, Targa (TGA), CompuServe GIF and AMiga IFF/ LBM formats.

Also included is FotoExplorer software from FotoNation Inc. which makes bringing images into Adobe Photoshop from many popular digital cameras as easy as accessing files from a desktop folder.

#### CONCLUSION

Photoshop 5.0 is a major upgrade to this industry-standard program and well-worth the cost. I have used Photoshop since the original release and cannot imagine not having it. Whether using it for a quick touch-up for a news shot, for creating an elaborate Web page or for serious design work, Photoshop is the best tool. The improvements in the latest version make it a "must have" for anyone doing virtually any sort of design work.

The one issue that may arise for some is the requirements for loading the software. Adobe recommends 64-MB of RAM and a minimum of 80 MB of disk space. However, take my word for it: you will need much more than 80 MB of space. Disk drives are so cheap these days that upgrading your old drive should not be a problem for most, but it is something you may have to do and does add to the overall cost of using the product. Personally, I think the functionality of versions 5.0 is worth the cost of the needed hardware upgrade. •

#### SYSTEM REQUIREMENTS:

#### WINDOWS:

32-MB RAM (64-MB recommended)

- 80-MB of available hard-disk space (Large capacity disk recommended)
- 256-color display card (24-bit display card recommended)
- CD-ROM drive

#### MACINTOSH:

- · PowerPC based Macintosh computer
- · Apple System 7.5 or later
- · 32-MB of RAM (64-MB recommended)
- 80-MB of available hard-disk space (Large capacity disk recommended)
- · 256-color display card (24-bit displaycard recommended)
- CD-ROM Drive

#### CONTACT:

Adobe Photoshop 5.0

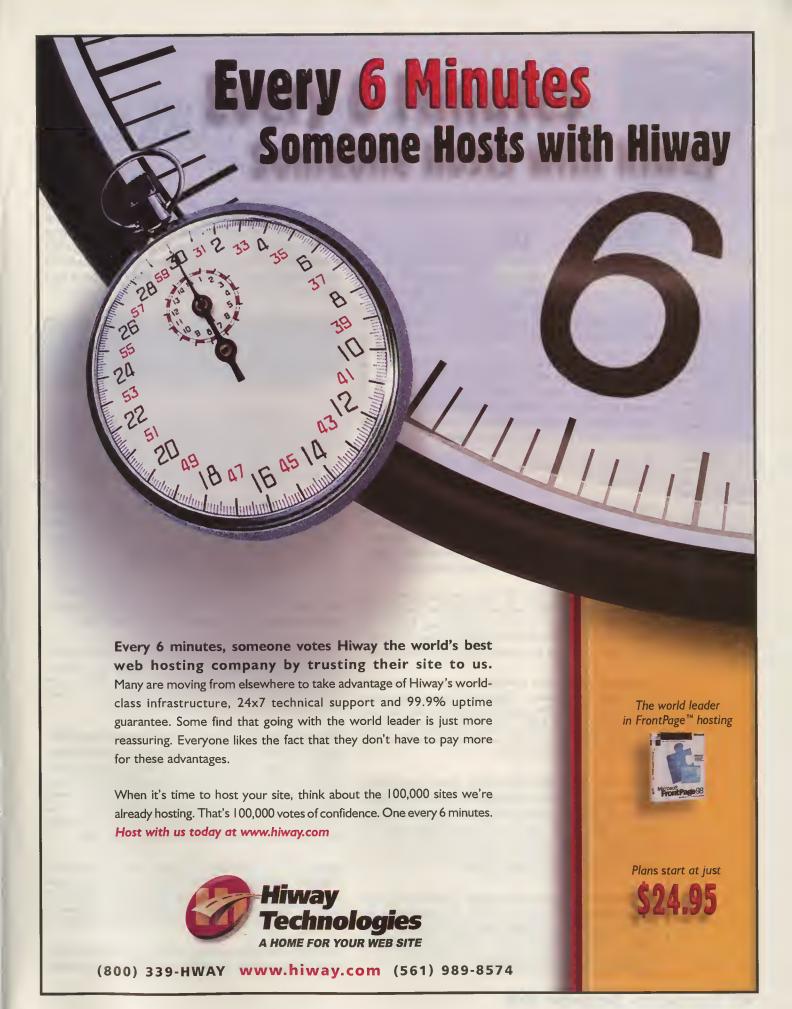
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# PUTTING THE NET TO WORK by Durant Imboden

FRAMING WEB PAGES, DAVID VS. GOLIATH

FRAMING THIRD-PARTY WEB PAGES

Then Netscape introduced frames in Navigator 2.0, most complaints involved the difficulty of navigating, bookmarking, and "deep linking" to pages on framed sites. There was little concern about the potential for "frame abuse" - i.e.,

the framing of third-party content without permission.

Today, a growing number of commercial Web sites are framing pages on other sites. Some, like Lycos and The Mining Co., make it clear that framed third-party pages aren't theirs; others, such as TotalNEWS, have been accused of appropriating copyrighted material and serving it up as their own content.

Web designers typically adopt one of four approaches to framing:

Surround framing. A third-party page is framed on all four sides, like a photograph, often with banner ads or sponsorship messages in the frames. TotalNEWS uses this approach on some of its pages; you can see examples at www.totalnews.com.

Navigation frame. The Mining Company, www.min ingco.com, uses this method. A shallow frame with navigation buttons is located along the top, bottom, or side of the page, but the frame doesn't contain advertising and produces no revenue for the framing site.

Navigation frame with breakout command. Here, the navigation frame has a "Remove frames" command that makes it easy for users to see and bookmark the third-party page's URL. Lycos Community Guides take this approach; you can see examples in the "Web Guides" at www.lycos.com.

No frames. Most Web sites don't frame third-party content at all - some because they've never thought of it, and others because they have a policy that forbids it. MSN has such a rule, probably because Microsoft's attorneys are leery of lawsuits or don't want the company to get blamed for the sins of Web masters who aren't on their payroll.

Why frame third-party Web pages in the first place? The obvious answer may be best: It keeps users on your site, or at least it helps them find their way back. Jake Levich, a senior editor at The Mining Co., explains why his company's nearly 600 sites use a small "top bar" navigation frame:

"The frame helps users get around The Mining Co. efficiently and, perhaps more importantly, lets them surf the Web without getting 'lost.' With the frame, no matter how far afield they surf, they can always get back to where they started. Our testing and feedback suggest that users like the frame and perceive it as a genuine benefit."



Levich adds that The Mining Co. has had very few complaints from owners of linked sites. "Our frame is unobtrusive and reducible, so it's not surprising that most Web masters don't mind it, especially considering the traffic they get from a Mining Co. link."

Brenda Howard, guide at The Mining Co's Telecommuting site (http://telecommuting.min ingco.com), also defends the use of navigation frames. "In over a year of managing a site at The Mining Co., I've never had another Web master complain about the frames on my site," she says. "Longtime Web masters don't like frames, but my experience with the Internet-savvy business person has been an understanding of frames and why they are used."

The Internet Baglady at www.dumpsterdive.com takes a less charitable view of navigation frames. "Sites that trap others' content within frames are nothing more than a bunch of low-life content thieves!" she insists. "A bunch of scalawags!"

The manager of MSN's Chronic Diseases and Disorders Forum, http://forums.msn.com/disease, offers a more diplomatic rationale for avoiding frames. "I think including any frame other than that of the site being highlighted can mislead the viewer. People put far too much work into their sites to have even the remote possibility that there be confusion over who owns and produces the site," she says.

Levich of The Mining Co. feels that Web masters shouldn't confuse navigation frames (such as those used on The Mining Co. or Lycos) with the "surround frames" that led a consortium of major newspapers to sue TotalNEWS for copyright infringement in 1997.

"Crucially, we don't carry advertising in our frames," he points out. "My understanding of the TotalNEWS

# Above the Net



lawsuit is that the plaintiffs felt TotalNEWS was taking a free ride on other people's content by running ads in the frame." He adds: "We're not wedded to the frame, of course. But as long as our users think it's valuable, there's good reason to keep it."

When asked why The Mining Co. doesn't implement a "Remove frame" command, ala the Lycos Community Guides, Levich explains:

"We've talked about it, but it presents some programming challenges. For instance, how would a user get the frame back once it's gone, particularly if he or she wants to return to The Mining Co. and resume navigating via the top frame? But we don't reject the idea out of hand. We always aim to stay responsive and adaptable."

Another point that none of the respondents made (but which deserves discussion) is the Web browser's role as a frame. One could argue that, by integrating search functions and "channels" into the browser, companies like Microsoft and Netscape are profiting from the display of third-party content. This is certainly true if search or channel placement is being sold to the highest bidder.

Similarly, an online service like AOL creates the perception of added value by displaying other sites' Web pages in a branded environment.

But let's get down to practicalities: If you're a Web master and someone has framed your pages, what should you do? Three options come to mind:

File a lawsuit. Don't try this unless you're independently wealthy. In the absence of legal precedent, taking a framer to court is a high-risk strategy. (The TotalNEWS case was settled out of court, by the way — and TotalNEWS continues to frame content from news sites that weren't involved in the lawsuit.)

Request to be unlinked. A polite e-mail that says, "I don't like having my pages framed, so could you remove your link to my site?" is a simple solution. You can also ask to have a target="\_top" tag added to the link, and the person linking to your site may comply if your content is too valuable to be ignored.

Fight back with code. Some sites include a "Break out of frames" command; others make it difficult or impossible to frame their content. Here's what you'll find if you view the source code at Hans-Henrik T. Ohlsen's "Copenhagen Pictures" page at www.danbbs.dk/~ais/copenhagen/index.html:

<script language="javascript">
<!-- Sorry - do not want to be included in a frame.
if (top.frames.length!=0)</pre>

top.location=self.document.location;

// -->

</script>

Insert your own snippet of JavaScript between the <head> and </head> tags on your pages, and you'll foil the framers - although you may lose some traffic in the process.

#### DAVIDS VS. GOLIATH: IS YAHOO! VULNERABLE?

As I write this column, The Mining Co. has just unveiled banner ads titled "Fear" and "Cover up" as part of a massive summer advertising campaign for "The 500 sites Yahoo! is afraid to list."

The tagline refers to Yahoo's blanket refusal to include Mining Co. sites in its index. Yahoo! argues that The Mining Co. is one site, and that individual Mining Co. sites such as my own Europe for Visitors (http://goeurope.miningco.com) are mere "subpages" under the miningco.com domain. The Mining Co. disagrees; in an article for Search Engine Watch, Denny Sullivan quotes The Mining Co.'s Jake Levich as saying:

"There are many examples of other sites with multiple Yahoo category listings, including ZDNet, The Rough Guides, Argus Clearinghouse, Citysearch, ESPN Sportzone, TV Guide, GeoCities, all the TV networks' TV show sites, Excite's various services, ISP-produced features and home pages and many, many others."

(You can read Sullivan's article at http://searchenginewatch.com/sereport/9801-miningco.html.)

After months of fruitless negotiations with Yahoo!, The Mining Co.'s honchos decided to strip off the kid gloves and duke it out with the boys from Stanford. The "Fear" and "Cover up" ads are just the first step in a campaign to increase brand recognition while capitalizing on Yahoo's weaknesses.

Will the strategy succeed? Can David beat Goliath, or at least leave a bruise or two on the big guy's shins? That's hard to say, but there's little doubt that Yahoo! is vulnerable on one count: the quality of its index. Yahoo! is often criticized these days for having too few quality listings and too many dead or outdated links. The situation is so bad that a group of disgruntled Yahoo! users have created "Newhoo!" as an alternative to the No. 1 search index.

## NewHoo!

Newhoo!, a noncommercial site at www.newhoo.com, claims to have nearly 800 volunteer editors who find, list, and maintain links in thousands of Yahoo!-like categories. The index is skimpy as I write this, but it's growing quickly, and the number of editors has doubled in recent weeks. Still, Newhoo! may find it difficult to maintain editorial quality while relying on user-created content. Net librarianship doesn't offer the creative satisfaction of a page at GeoCities to Tripod, and checking existing links for 404 errors is more drudgery than fun — especially when there's no paycheck or royalty statement at the end of the month.

Yahoo!, in the meantime, continues to watch its stock value grow like mushrooms after a week of rain. Its core service, the Web index, may be developing cracks from having only 80 editors to process submissions and monitor existing links. But Yahoo! has great name recognition, it offers potentially profitable services like the Yahoo! Store and classified ads, and — unlike most competitors — it's operating in the black. Like America Online, Yahoo! may be proof that a strong brand identity is more important than what's inside the box. ◆

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# ONSUMMATE WINSOCK APPS by Forrest Stroud

#### ASSAULT OF THE WEB GRAPHICS TOOLS

**7**eb graphics creation and optimization tools are all the rage lately, and the competition should only get fiercer as the big boys continue to enter the fray. Tools like Ulead's GIF Animator and GIF Construction Set brought about the emergence of Web graphics tools, but while these apps focused primarily on creating animated GIFs, the new class of products widens the scope to creation, manipulation, and optimization capabilities for all types of Web graphics.

(ImageReady), Macromedia (Fireworks), and to a lesser extent Microsoft (Liquid Motion) fill a need currently lacking in commercial graphics applications like Adobe Photoshop. And while most of the new tools are a bit on the expensive side, if you spend any significant amount of time developing or working with graphics for the Web, the high price of one of these tools is more than offset by the savings in time, frustration, and overall satisfaction.

The latest Web graphics tools from the likes of Adobe

#### Macromedia Fireworks Everything you need to create, optimize, and animate cool Web graphics Excellent tools for publishing graphics on the Pros: Web, Export Preview window, LZW interframe optimization Expensive, no GIF/JPG preview, lacks some of Cons: the features found in specialized Web graphics Location: http://download.macromedia.com/pub/fire works /english/win/1.0/fireworks-esd.exe Platforms: Windows 95/98, Windows NT, Power Mac Free 30-day evaluation. Commercialware - \$299 Status: Company: Macromedia Website: www.macromedia.com/software/fireworks

Fireworks is the latest all-in-one Web graphics creation, animation, and optimization tool to hit the Net. This combination vector and bitmap imaging app especially excels at optimization tasks for GIFs, animated GIFs, JPEGs, and PNGs, but it's also a fullscale graphics creation and manipulation program like Adobe Photoshop. If you're a long-time Photoshop or Paint Shop Pro user, you'll probably find the Fireworks interface a bit difficult to adjust to, but after getting by the relatively short learning curve you'll find that Fireworks isn't lacking in many areas. Like Photoshop, Fireworks supports layers and will import the layering information of a Photoshop file without any problems. The app also supports editable, scalable text (a feature shared by the latest release of Photoshop, v5.0, and Adobe ImageReady); image slicing (cuts an image into separate segments and allows the slices to be loaded selectively on the Web, optimized individually, or even saved in different formats); JavaScript rollover capabilities (automatically generates HTML code for interactive buttons and graphic 'hot-spots'); and the ability to create image maps (both client-side and NCSA server-side image maps are supported).

#### 1.0 OFFICIAL RELEASE NOW AVAILABLE

New features in the official 1.0 release include symbols and instances (create a master object - the symbol - and copies of it - the instances - are automatically updated whenever the symbol is modified); image tweening (a cool morphing-like feature that blends aspects of instances or a symbol and its instance across objects, opacity, Live Effects, and transformations, creating interim frames with transitional attributes); a WebSnap Adaptive color palette for optimizing GIF images with browser-safe colors; and import capabilities for Photoshop, FreeHand, Illustrator, and Corel Draw (with an option for automatic translation of layers into animated frames for FreeHand and Illustrator files).

#### LIVE EFFECTS

Fundamentally, Fireworks is a vector-based imaging program, allowing you to create editable bezier paths and objects for more compelling images and animations. This results in editable "Live Effects" - for example, create some text with a drop shadow and when you change the text the drop shadow automatically changes with it. The time and frustration that this feature alone saves you will more than offset the product's rather expensive price tag. Every aspect of a graphic, including text, objects, and image maps, is fully editable and can have effects applied at any time, with the effects following changes in the underlying object automatically and in real-time.

#### **EXPORT PREVIEW**

The export preview is one of Fireworks' strongest features. The preview allows you to balance file size and image quality across a number of instances in order to create the optimal graphic - one that looks great and downloads quickly. You can use the preview to place the original image next to an optimized one, or you

The applications reviewed here and many more are available at Stroud's Consummate Winsock Apps List, http://cws. internet.com and www. stroud.com.

Forrest Stroud currently works in College Station, Texas as a Web developer for Mecklermedia Corporation. He recently graduated with honors from The University of Texas at Austin. The Information Systems and Data Communications Management major enjoys spending what little free time he has with his wife Joanne and the 'zoo' - an everexpanding collection of pets that currently consists of a Dalmatian pup (Svoda Pop), a chocolate lab cross (Roemer), a German Shepherd pup (Marius), and a pair of rascally kittens (Odie Pez and Bo Miggy). Animal lovers can check out pictures of the pets on Stroud's home page at http://person

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can create a view with the original image and up to three optimized ones, each with a different setting. For example, you can place the original image next to an optimized image in adaptive GIF mode, one in progressive JPEG mode, and another in 32-bit PNG mode.

In addition to the image itself, each preview displays the total file size, the time it would take to download the image on a 28.8 Kbps connection, the image format, and the format settings. You can fine tune each image to your heart's content with a number of GIF optimization settings and color depth options for GIFs, a quality scale and smoothing options for JPEG images, and a bit depth setting for PNG graphics. While Fireworks doesn't compress JPEG images as well as Image-Ready nor animation GIFs as well as a standalone GIF animation tool like Ulead's GIF Animator (although it does comes very close), its GIF compression capabilities are among the best on the market. Fireworks also supports LZW interframe optimization for better optimization of animated GIFs.

#### **CREATING ANIMATION GRAPHICS**

Creating animated graphics with Fireworks is a relatively straightforward process (although ImageReady does rival Fireworks for ease of use in this department), but unless you are creating an extremely simple animation, you'll save yourself a lot of time and frustration by using a specialized tool like Ulead's GIF Animator. GIF animation tools offer a variety of features and effects that you won't find in apps like Fireworks and ImageReady. These tools not only make it easier to create animations, they also allow you to create more effective and better optimized animations. One area of animation where Fireworks does excel, however, is in its ability to automatically translate the layers of imported FreeHand and Illustrator files into animated frames.

#### LIMITATIONS

One of Fireworks' limitations is that GIF and JPG files cannot be previewed in he File Open window like PNG files (which Fireworks uses as its native file format). Images also can't be scanned directly into Fireworks. Viewing an animated GIF is also only available in the export preview window, where you are able to configure the duration of each frame and make additional changes to the animation. And while Fireworks edges out competitors like ImageReady in terms of image optimization capabilities, ImageReady does retain an edge in one area — optimizing JPEG images.

#### **SUMMARY**

Overall, Macromedia Fireworks serves as an ideal all-in-one suite of Web graphics tools, but don't throw out your specialized GIF animation, image mapping, image optimization, and image creation tools just yet. Fireworks is a huge step forward, but in most cases the specialized tools still offer more features and better overall functionality. And compared to the Fireworks' \$299 price tag, you could buy a collection of the best standalone Web graphics tools and still have enough money left over to treat yourself to a Web clipart collection or two.

#### THE PERFECT COMPANION TO PHOTOSHOP

Adobe ImageReady is the perfect complement to Photoshop and Illustrator. The app gives users a complete set of tools for publishing graphics on the Web. Image compression in real-



time, built-in editing tools, quick and easy animation features, and batch-processing capabilities help you develop, optimize (via the LiveView window), and animate images. The interface is a breeze to get up and running with, especially for users of Photoshop or Illustrator. Many (but not all) of Photoshop's design tools have made their way into ImageReady, including key tools like marquee, lasso, eraser, pencil, paintbrush, and eyedropper; resizing commands; image adjustment commands; and Photoshop filters; and the new tools are simply intuitive Web extensions of existing features in Photoshop.

Photoshop is the premier imaging software app, but it has always been geared more toward print media - i.e. publishing images in advertisements, newsletters, magazines, etc. Rather than incorporating a complete set of Web graphics tools into Photoshop, Adobe decided to develop the standalone Image-Ready client. While many users might prefer to have ImageReady's set of Web tools built into Photoshop, one advantage to keeping them separate is that Adobe will be able to release ImageReady on a faster development cycle, insuring that users have the latest tools at their disposal for the always rapidly evolving Web.

#### SECOND BETA RELEASE NOW AVAILABLE

ImageReady is now in its second beta and is about a month away from official release. The second beta release adds several new features, including improved color reduction for better optimization, support for the recently released Photoshop 5.0, the ability to import a folder as a group of animation frames (with support for Adobe After Effects), and the ability to make a group of animation frames from a set of layers. As part of its support for Photoshop 5.0, ImageReady also offers Layer Effects, one of the new features in the latest release of Photoshop. Much like Fireworks' LiveEffects, Layer Effects allow you to apply effects like drop shadows and bevels to an image layer, and then any time the layer is modified ImageReady will dynamically update the effect as well.

One particularly useful feature in ImageReady is that when you select any pixel in an image, you are not only given its RGB (Red, Green, and Blue) values but also its hexadecimal value and its X and Y position in the image. The hexadecimal value is valuable if you want to blend a graphic in with a background color on a Web page. If you've been using Photoshop or

a similar tool to create Web images, you've probably had to open a third-party utility or an HTML editor like HotDog Pro to find the hexadecimal value of a color. Thanks to Image-Ready, no longer will you have to leave your graphics program to find a color's corresponding hexadecimal value. Macromedia's Fireworks offers a similar feature except it shows the RGB values \*or\* the hexadecimal values but not both at the same time.

#### CREATING ANIMATED GRAPHICS

Creating animated graphics with ImageReady is a relatively straightforward process, but unless you are creating an extremely simple animation, you'll save yourself a lot of time and frustration by using a specialized tool like Ulead's GIF Animator. GIF animation tools offer a variety of features and effects that you won't find in apps like ImageReady and Fireworks. These tools not only make it easier to create animations, they also allow you to create more effective and better optimized animations (for example, the animation in Figure 2 at http://cws.internet.com/32Webimg-imager eady.html optimized with GIF Animator uses only 8.4 KB whereas with ImageReady it occupies 12.8 KB). Two areas of animation where ImageReady does excel, however, are in its ability to import a folder as a group of animation frames and the ability to make a group of animation frames from an existing set of layers — two features not available in most GIF animation tools.

#### **IMAGEREADY FEATURES**

Features in the current release of ImageReady include support for Photoshop API filters; editable/scalable text (a new feature in Photoshop as of v5.0), tweening (a cool morphing-like feature that blends aspects of different images, creating interim instances with transitional attributes), the ability to create client-side image maps (by assigning URLs to layers in an image), two adaptive color palette controls (straight adaptive and perceptual, which weights colors for human sensitivity and significantly improves quality in most cases), a lock button on optimized color palettes that allows you to "lock down" specific colors so that they won't be dropped when reducing the overall number of colors, and a Web shift button for automatically shifting a specific palette color to the closest Web-safe palette color.

Additional features include a Droplets tool that allows you to drag and drop a batch of files and have them automatically compressed using a set of user-defined options, a history palette that keeps track of every compression scheme you've tried for an image and allows you to step through previous versions to compare image quality, a browser dither view that simulates the preview of a browser on an 8-bit (256 color) display, automatic rasterization of Illustrator and other vector-based image files, gamma preview and correction capabilities that automatically account for differences between viewing images on Windows and Mac platforms, and automated image slicing capabilities (allows designers to split an image along user-defined guidelines for more precise layout control on the Web).

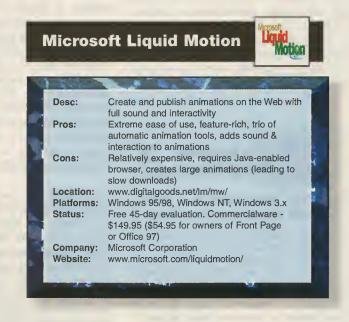
#### **LIMITATIONS**

ImageReady definitely isn't perfect, which shouldn't really come as a surprise considering the client is still in beta release. The client is quite buggy in a number of areas and needs considerable tweaking in terms of performance. The real-time image optimization is an extremely cool feature, but in the beta release it takes entirely too long to convert images - especially for large graphics. Online help documentation is also absent in the beta release. ImageReady lacks a few of Fireworks' more Web-centric features as well, including its JavaScript rollover capabilities (automatically generates HTML code for interactive buttons and other graphics), its support for server-side image maps in addition to the more popular client-side image maps, and its vector-based interface, which allows you to apply customizable Live Effects to any object.

Fireworks also edges out ImageReady in terms of optimization capabilities. The ability to view a non-optimized image side-by-side with an optimized image (or even three different optimized images) is a standard feature in Fireworks that is sorely missed in ImageReady. And in terms of optimization effectiveness and quality, for the most part Fireworks again edges out ImageReady, largely due to its support for LZW interframe optimization. However, ImageReady does a much better job of optimizing JPEG images than Fireworks (except it takes ImageReady considerably longer to optimize them).

#### **SUMMARY**

Overall, ImageReady serves as a great sidekick to Adobe Photoshop, but at \$199 (\$100 cheaper than Fireworks incidentally) ImageReady isn't for everyone. And at this early stage, you definitely won't want to throw out your specialized GIF animation, image optimization, and image creation tools. ImageReady is a huge step forward, but the specialized tools still offer more features and functionality. But if you're a current user of Photoshop and have been looking for an all-in-one Web graphics suite, ImageReady makes for the perfect companion.



Microsoft's Liquid Motion offers an innovative way of developing animated images for use on the Web. Unlike the standard animated GIF images that you see almost everywhere you look on the Web these days, Liquid Motion uses Java to develop animated graphics. Liquid Motion animations will play in any Java-enabled browser that supports JavaScript, effectively limiting them to use on Internet Explorer 3.0 and Netscape Navigator 2.0 and later browsers.

Liquid Motion also offers advanced animation support for Internet Explorer 4.0. Features like 3-D shapes, DHTML filters and transitions, audio panning, and some image and audio formats will only play on IE 4.0 browsers, while the rest of the Liquid Motion animation will play on any Java-enabled browser. And while Microsoft touts Liquid Motion as a 'no plug-in needed' animation solution, any time you play a Liquid Motion animation in Netscape you will be presented with a dialog to download the optional Microsoft Liquid Motion advanced performance controls for better performance.

#### **EXTREMELY EASY TO USE**

More than anything else, Liquid Motion excels in ease of use. An introductory tutorial will help you get started with the basic model underlying Liquid Motion - adding behaviors (motion, interactivity, etc.) to standard objects (images, text, etc.) and thereby creating animated content. Additional tutorials will then take you step-bystep through the process of creating instant animations. A wide range of sample animations and templates are also available for helping you get a jumpstart on the action. More in-depth information is available in the form of User Guides, which cover both basic and advanced operations in detail. Finally, a 'How Do I?' help section acts as an FAQ (Frequently Asked Questions) for helping novice users get past the initial learning curve associated with creating animations.



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In addition to its extensive help documentation, Liquid Motion offers a number of features that add to its ease of use. For example, the client offers complete integration with FrontPage 98, allowing users of the Web site editor to automatically add Liquid Motion animations to FrontPage 98 Themes and existing Web sites. Liquid Motion also offers one-button publishing capabilities, in which a wizard takes you through the process of optimizing your animation and then automatically uploads it to your Web site.

While the registered release of Liquid Motion includes more than 2,000 clip art samples, the downloadable demo is a bit more limited in nature. 31 standard GIF images, 10 2-D shapes (Macromedia FreeHand files), 13 3-D shapes, 7 MIDI audio files, 5 AU audio files, and 5 WAV audio files (same clips as the AU files only encoded in the WAV format) are available for use in creating your own animations. While a bit limited in number, the demo's samples will give you a good idea of how useful the full version's clip art collection can be in helping you create animations.

#### AUTOMATIC ANIMATION FEATURES

Additional features in Liquid Motion include a Smart Timeline that gives users a visual timeline for when various objects will begin their animation routine and when they will finish, an Animation Recorder that records the movements of an object as you move it around the page, unlimited undo and redo capabilities, a Structure View that allows you to manage each object and any behaviors associated with it, and a trio of automatic animation features — AutoEffects, Auto Motions, and AutoTriggers.

AutoEffects give users one-click access to Web effects like smoke, bubbles, sparklers, and clouds for their animations. Auto-Motions let users add actions like grow, shrink, jump, and spin to objects. The only downside to these motions is that they are limited to use on Internet Explorer 4.0. AutoTriggers are interactive controls that you can add to your animation objects to allow them to react to mouse movement. Available triggers include mouse avoid/mouse follow, mouse up/mouse down, mouse enter/mouse exit, mouse drag, and URL linking.

#### LIMITATIONS

If it weren't for the auto-animation features, Liquid Motion would be tough to recommend, especially considering its \$150 price tag. A high-quality animated GIF tool like the inexpensive GIF Animator from Ulead will allow you to create animated GIFs that in general download much faster on the Net than comparable Liquid Motion animations. This is due to a number of factors, including Liquid Motion's reliance on Java for its animations (animated GIFs do not need Java classes to be pre-loaded in order to play on a Web site), better optimization capabilities in high-end animated GIF tools like GIF Animator, and the need for only a single image to be downloaded as opposed to a group of images and the animation settings for those images.

Another drawback to Liquid Motion is that when importing a standard graphic, the client only allows GIF and JPEG images to be imported. While this leaves out file formats like PNG (Portable Network Graphic), PSD (Photoshop), and TIFF, you can get around this limitation by dragging and dropping any type of image into Liquid Motion from another graphics app. Still, it's surprising to find these features lacking in a high-end design tool like Liquid Motion.

#### SUMMARY

Despite the numerous advantages of animated GIF tools, if you have a highly complex animation or want to add sound or interactivity options to an existing animation, Liquid Motion is the best way to go. While VRML animations offer a number of similar features, users must first download a VRML plug-in in order to view them, and, like those of Liquid Motion, VRML animations tend to be quite large in terms of file size. While a perfect compromise between animated GIFs and VRML animations may not be available for quite some time, Microsoft Liquid Motion has taken the all-important initial step towards that elusive goal. •

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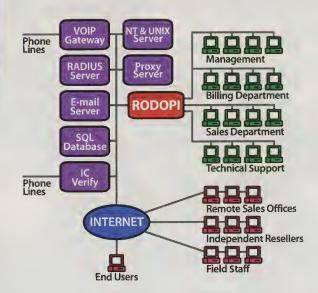
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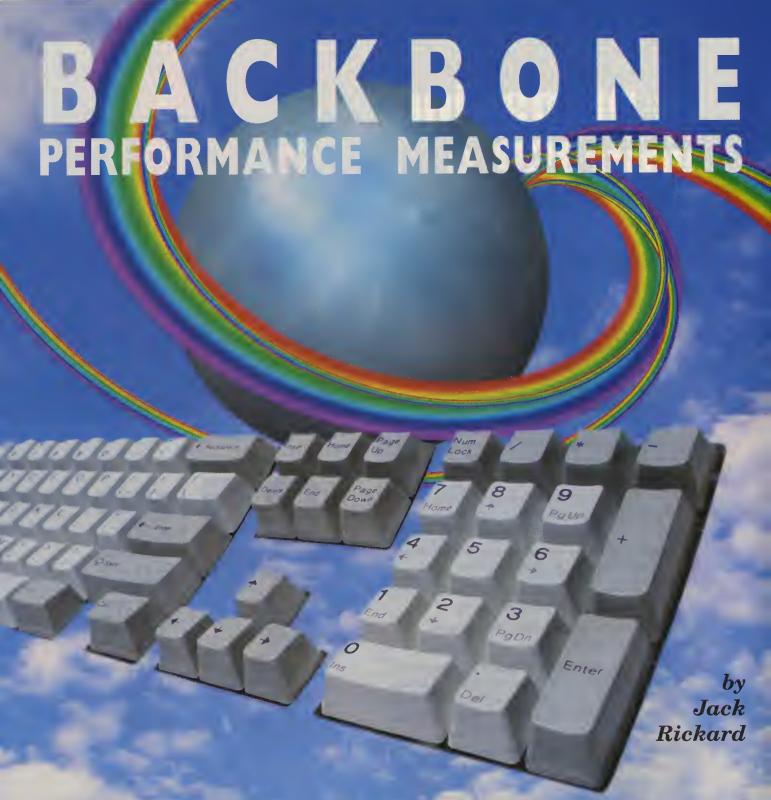




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usinesses connected to the Internet, or seeking to connect to the Internet, face a Herculean task in doing so. Almost everyone at this point understands they need to be on the network, and the frenzy to get a Web site up and become part of the e-commerce world before your competitor does is beginning to resemble a panic in some respects. There are now some 39 major backbone companies, and nearly 5,000 local and regional Internet service providers who will most willingly provide a connection.

Choosing between them is non-trivial. They have not only different prices, but different pricing methodologies, and as it turns out, no firm prices at all. These companies list prices and will quote prices and it would appear negotiate them at will depending on how bad you need an Internet connection, and how badly they want you as a customer.

As to what you are actually buying, things get a little vague here. Basically, any of these service companies

# MEASURING THE INTERNET

want to sell access to THEIR network - a product with essentially zero demand. Customers typically are interested in accessing the Internet, a product for which no vendor really has any control. Who provides the best access to the Internet? That's essentially a function of the persuasiveness of the account representative, and the very compelling story he tells using the latest in PowerPoint presentation technology on his laptop.

Even after you have selected a vendor and have a connection, it looks remarkably like a telephone jack in the wall - owing largely to the fact that it IS a telephone jack in the wall. It works, more or less, and some days it works better than others. You might have much better service and much better access on the Internet with someone else, at either a greater or lower price as it turns out. How would you know?

Milk is sold by the gallon. Electricity by the kilowatt hour. A gallon is measurably a gallon - 231 cubic inches of liquid. And similarly if you consume 8.333 amperes of current at 120 volts for an hour, it really is a kilowatt hour - ignoring phasing. Internet access is generally sold by bandwidth - a 1.544 Mbps T-1 line would be a common example. But you don't actually get 1.544 Mbps of bandwidth to the Internet. You generally get that from your location to the service provider's nearest point of presence. At that point, you disappear into the cloud and you get what you get depending on where the data is going to or from - down to a couple of hundred bytes per second in fact.

Measuring the Internet is non-trivial for a number of reasons.

- 1. What are you measuring? Different aspects of Internet performance are important. If you're worried about how long it takes your e-mail message to get to Hong Kong, you might be singularly disinterested in file transfer speeds. On the other hand if slow Web pages annoy you and your customers, they may not care at all about dial-up call completion rates.
- 2. The Internet is inherently anomalous with regards to time. Any Internet access will behave differently from one moment to another, one hour to another, one time of day to another, weekdays differently from weekends, and there are even seasonal waves. Internet access is somewhat more facile at 2:00 a.m. than 2:00 p.m.
- 3. The Internet is inherently anomalous with regards to geography. Access in Phoenix may seem quite different from access in San Francisco or Sao Paulo.
- 4. It's quite possible to measure something that nobody cares about, understands, or that can be communicated. Packet latency and packet loss spring to mind. Who knows, who cares, and who has time to listen to the explanation?

Over the past year, we have devised a series of measurements somewhat widely known as the *Boardwatch* Backbone Performance Index. This is a massively averaged collection of some three million measurements taken from a variety of locations across a 30 day period to attempt to define performance in a relative sense. Since we have found no way to measure against an outside reference such as cubic inches, we relate to time and do so relatively comparing times from one backbone to those of another.

#### WHAT IT MEASURES

Backbones offer a variety of services. But typically, those who would purchase such a service directly from a backbone, rather than from one of 5,000 non-backbone Internet service providers, are looking for a home for a Web site, or a dedicated connection for their office of some horsepower, usually again to host a Web site internally. The better the access they purchase, the more accessible their Web site will be to those who access it - ostensibly their customers or visitors.

So the measurements are heavily from the perspective of Web hosting, and selecting a position in the Internetscape to locate a Web site. It also focuses entirely on the Hyper Text Transfer Protocol or HTTP used to transmit Web pages. It is true there is a micropercentage of the world very interested in how video goes point to point across a network. And I suppose when I send an e-mail message that I do want it to get there in some timely fashion. But almost all complaints of Internet "slowness" seem to revolve around Web access to the almost total exclusion of all else.

So these tests reflect the performance of backbones as they relate to hosting and positioning a Web site on the Internet. You cannot simply reverse this and then say, "If I dial-up to an ISP that is connected to this backbone, I'll have better download performance." It doesn't work that way, and perhaps a brief technical explanation will illustrate why.

HTTP, and in fact most Internet traffic, transits under a dubious economic assumption that somebody has to pay to haul the freight. As a result, a concept termed hot potato routing evolved that basically decrees that packets are offloaded to the home network of the DESTINATION address of the packets at the earliest opportunity. Let's look at a typical Web session between a dial-up caller to the Sprint network in San Francisco, and a Web site on the MCI network in Austell, Georgia.

When the user clicks on the URL for the Savage Pony Web site (an example), the browser sends a packet, and about one packet at that, to the Web site. Under hot potato routing, the packet will be examined for a destination address, and since this destination address is on the MCI network, the packet will be handed off, probably right in San Francisco. It will travel across the continent entirely on the MCI network to the Web site location in Austell, Georgia - home of the Savage Pony Web site.

The Web site then sends a page with seven graphic files, each of 325 KB size, to the caller's location in San Francisco. This is a LOT of packets. But the packets have a SPRINT destination address and so MCI will haul them to the closest or topographically most convenient exchange location - probably Washington, DC. These packets then transit the entire continent on the SPRINT network to reach the end user.

So the traffic for an HTTP session is not just grossly asymmetric in that most of the data runs from the Web site to the end user, but it does unusual things with regards to network symmetry. We are measuring a download from a Web site on the MCI backbone, but the entire data flow is primarily on the Sprint network.

Note that BOTH flows have NO relationship to the route traced by a Traceroute command. They may not even go through the same states.

#### GEOGRAPHIC DIVERSITY

If we pick a diverse set of locations, on a diverse set of networks, and measure from each of them to the Savage Pony Web site, we essentially draw what I think of as most akin to a child's spirograph diagram across the Internet with different pen loops of the spirograph originating in different cities, and on different networks, all pointed at Savage Pony. This can give us a very GOOD intersecting view as to the cumulative VISIBILITY of the Savage Pony Web site to the rest of the Internet - as it is provided by MCI. But in general it is measuring MCI's connectivity to the other networks, not the performance of data from one point on the MCI network to another. This explains why using the Internet for a different purpose, say sending e-mail or dial-up access performance, simply doesn't apply to these measurements. A different test methodology would have to be used to test those things. And in fact, we've had some success on the dial-up front with an entirely different test series measuring call completion rates - busy signals.

To achieve this geographic diversity, Keynote Systems locates measurement agent machines at different Internet service providers, connected to different backbones, in different cities across the country. Currently, they have 74 measurement agents on 15 different networks in various cities across the country. The placement of these is modeled on the statistical distribution of population in metropolitan areas, as well as our best guess as to the statistical distribution of end users across networks. More users are on UUNET than AGIS for example, so a proportionally greater number of measurement agents are located somewhere on the UUNET network. To the degree we succeed in modeling the ethereal Web user population, we can measure how accessible or not your Web site is if you are connected to any particular backbone.

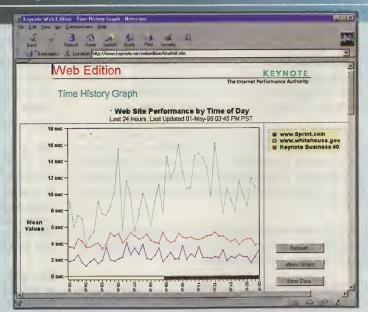
#### TIME DIVERSITY

The Internet is anomalous with regards to time as well. The measurements presented here are taken from all locations every 15 minutes, 24 hours a day, over a period of a month. By massively averaging the results across this large number of measurement sample times, we broadly factor out the noise of the time waves hour to hour, day to day, and week to week to derive an average for each network that would then be comparable. The resulting values have no external reference, they don't mean much on their own terms. Nominally, they are timed downloads of 10 KB of data from the Web site located on the backbone under test. The resulting time is multiplied by a

# **About Keynote Systems**

eynote Systems, based in San Mateo, CA, is the world's leading supplier of Internet performance data and diagnostic services to companies with e-commerce or mission-critical Web sites.

Keynote's global real-time service - Keynote Perspective - enables the company's customers to measure, compare and optimize the Quality of Service of their sites, improving competitiveness and customer satisfaction. The foundation of the service is an extensive network of customizable software measurement agents connected to major Internet backbones in dozens of metropolitan areas worldwide, plus a sophisticated operations center for collecting, analyzing and disseminating Internet performance data. Keynote



customers include some of the world's busiest and most successful e-commerce and mission-critical web sites, and Web-hosting service providers. Prices range from \$295 to \$695 per month for each URL, depending on how many agents are activated.

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factor of five in an attempt to simulate a 50 KB Web page consisting of five, 10 KB files. Since all the measurement agents are directly connected, there is no compression factor and it matters none if the data is actually text or graphics.

#### **MEASUREMENT DATA**

The entire data set represents some 3,674,986 discrete measurements across the 34 backbones measured. The average download time across the entire data set was 10.203 seconds for a typical 50 KB Web site page consisting of five, 10 KB files.

In this measurement period, World-Com's UUNET backbone topped the average download time rankings with a time of 6.723 seconds - just edging out MCI's backbone at 6.727 seconds - realistically too close to call. It is interesting that with these two networks in the news regarding the MCI/WorldCom merger, and MCI's resulting agreement to divest itself of the MCI Internet line to gain approval of the merger, that these two networks would come in so closely at the top of the average performance charts.

#### DISTRIBUTION GRAPHS

With this issue, we are dropping the view by city in favor of a series of data point distribution graphs in an attempt to provide another view of this data that might be useful. In a world of variance, we tend to simplify things conventionally using the average technique. It's familiar, and it feels representative. But it can be misleading.

Assume you have 95 measurements of 5 seconds each, and five measurements of 50 seconds each. The "average" would be 7.25 seconds. But in truth, NOBODY ever got 7.25 seconds. You have a 95 percent chance of getting a 5 second download. On the other hand, if you're one of the poor hapless yucks sitting there, waiting 50 seconds for a Web page (and who hasn't now that I think about it), the 7.25 second "average" does little to assuage your pain.

We did receive several reader suggestions to show the actual distribution of data points and the median values under the theory that this might provide another view of the data. We agree.

The median value of any data set, is that point in the series where exactly half of the values collected are greater, and half of the values are less. In our scenario

#### **Agent Locations and Networks**

**Network** MCI

WinStar GoodNet, MCI, UUNET

let

MCI, GTE

**UUNET** 

The cities and networks where the sampling agents were located.

Oite Otete
City, State
Atlanta, GA
Boston, MA
CChicago, IL
Chicago, IL
Cleveland, OH
Columbus, OH
Dallas, TX
Dallas, TX
Denver, CO
Detroit, MI
Detroit, MI
Houston, TX
Houston, TX
Kansas City, MO
Los Angeles, CA
Los Angeles, CA
Los Angeles, CA
Miami, FL
Milwaukee, Wl
Minneapolis, MN
New York, NY
Omaha, NE
Philadelphia, PA
Phoenix, AZ
Pittsburgh, PA
Portland, OR
Salt Lake City, UT
San Diego, CA
San Diego, CA
San Diego, CA San Francisco, CA
San Francisco, CA
San Francisco, CA
San Francisco, CA
Seattle, WA
St. Louis, MO
Tampa, FL
Washington, D.C.
Washington, D.C.
• • • • • • • • • • • • • • • • • • • •

	Backbone	Ag
asimigion, D.O.	DIGEX	
ashington, D.C.	DIGEX	
asnington, D.C. ashington, D.C.	Verio	
mpa, FL ashington, D.C.	UUNET	
. Louis, MO	MCI, UUNET WinStar GoodNet	
eattle, WA	UUNET, MCI	
in Francisco, CA	Exodus	
n Francisco, CA	DIGEX	
n Francisco, CA	WinStar GoodNet	, UUNE
n Francisco, CA	MCI, Sprint, UUN	
n Diego, CA	UUNET	
n Diego, CA	Verio	
It Lake City, UT	ELI	
ortland, OR	ELI	
ttsburgh, PA	MCI	
noenix, AZ	MCI	
niladelphia, PA	AGIS, CRL	
naha, NE	Sprint, MCI	
w York, NY	TCG CERFnet	
ew York, NY	MCI	
w York, NY	AGIS, MCI, DIGE	X, UUNE
w York, NY	UUNET, Sprint, C	RL
nneapolis, MN	MCI	
lwaukee, WI	GTE	
ami, FL	AT&T	
s Angeles, CA	GTE	
s Angeles, CA	Concentric, Winst	ar GoodN
s Angeles, CA	MCI, UUNET	
insas City, MO	MCI, Sprint, UUN	ET
ouston, TX	UUNET	
ouston, TX	MCI, Sprint	
etroit, MI	AGIS, MCI, Sprin	t, UUNET
etroit, MI	MCI	
enver, CO	GTE, MCI, Sprint	
illas, TX	Verio, UUNET	
Illas, TX	CRL	
olumbus, OH	MCI, UUNET, DIG	
eveland, OH	ANS, DIGEX, MC	LUUNET
icago, IL	GTE	, WO, U

Agent
distribution
by
backbone

provider:

DIGEX	
Backbone	Agents
MCI UUNET Sprint DIGEX GTE WinStar GoodNet AGIS CRL Verio ELI ANS AT&T	20 17 7 5 5 4 3 3 2 1
Concentric	1
Exodus	1
TCG CERFnet	
Total	74

above, with 95, five-second measurements and five, 50 second measurements, another oddity occurs. If we sort them all by value, and take the 50th element, we get 5 seconds as the value. This strongly discounts, and in this extreme case even eliminates, the effects of the five 50-second outliers. So I would strongly question that median is more meaningful than average, it is just a different view. The basic problem remains how to represent 108,000 measurement points on a page in meaningful terms.

By actually graphing the distribution of data points by value, we can draw a bit of a curve that allows us to compare networks. The graphs provided take the entire data set of roughly 108,000 data points for each backbone, and depict them by second. All the data points falling between 0 and 1 second are shown in the column marked 1, between 1 second and 2 seconds in the second column, etc. These are shown graphed as a percentage of the total data set in each case, and the actual quantity of data

points falling in that value range is annotated on the graph.

The column marked 31 is actually quite interesting. It represents the total number of measurements that exceeded 30 seconds. They might have exceeded it by a second, or by 10 minutes. But it gives a strong visual indicator of the percentage of measurements where the wheels totally fell off and the download was dragging sparks from the axle.

### SUMMARIZED MEASUREMENT DATA

BACKBONE	Median	AM	PM	Average	Ratio	Std Dev	Monthly	Data Points
AGIS	2.070	1.765	2.360	10.336	1.337	35.270	\$1,500	104,049
ANS	3.425	3.250	3.585	9.967	1.103	27.317	\$2,850	109,221
AT&T	2.385	2.240	2.575	8.556	1.150	29.194	\$2,225	109,036
Bell Canada	3.395	3.240	3.645	9.350	1.125	24.544	\$2,200	109,272
Cable & Wireless USA	3.850	3.585	4.210	11.013	1.174	30.978	\$1,824	108,972
CAIS Internet	3.710	3.600	3.950	9.782	1.097	31.453	\$1,595	108,782
CompuServe	2.175	2.090	2.265	6.755	1.084	24.984	\$2,500	109,211
CRL	6.135	6.065	8.370	17.015	1.380	36.541	\$1,425	108,264
DataXchange	4.060	4.360	4.125	11.983	0.946	34.603	\$1,995	109,268
DIGEX	2.020	1.890	2.180	7.857	1.153	27.327	\$2,070	109,200
ELI	3.580	3.520	3.780	9.250	1.074	26.836	\$2,000	109,072
EPOCH	2.505	2.320	2.830	10.819	1.220	35.737	\$1,795	105,687
Exodus	2.665	2.465	2.820	10.160	1.144	40.261	\$1,199	109,236
Fiber Network Sol.	2.285	2.165	2.550	8.616	1.178	31.169	\$1,495	109,280
Frontier GlobalCenter	2.845	2.640	3.060	10.350	1.159	31.131	\$1,595	108,577
GeoNet	3.795	3.655	4.010	13.576	1.097	37.045	\$1,050	109,154
GetNet	4.115	3.930	4.435	12.753	1.128	40.211	\$2,000	109,270
GTE	3.750	3.580	3.945	8.608	1.102	24.233	\$1,955	109,278
IBM	3.290	3.150	3.430	8.759	1.089	25.393	\$3,000	109,124
ICG Netcom	4.275	4.035	4.530	10.753	1.123	28.227	\$1,200	108,681
Icon CMT	3.520	3.390	3.665	10.153	1.081	29.166	\$1,500	108,936
IDT	1.840	1.710	2.130	6.893	1.246	24.790	\$1,400	109,119
MCI	1.845	1.705	2.045	6.727	1.199	22.603	\$1,870	108,900
Priori Networks	3.650	3.485	3.875	8.776	1.112	26.347	\$1,950	108,951
PSINet	7.610	7.955	8.370	16.884	1.052	36.907	\$1,895	106,346
SAVVIS	2.595	2.480	2.700	7.021	1.089	22.741	\$2,000	108,778
Sprint	2.675	2.530	2.960	9.360	1.170	32.192	\$2,286	108,358
TCG CERFnet	3.335	3.140	3.555	8.924	1.132	24.370	\$2,100	108,011
UUNET	2.180	2.095	2.305	6.723	1.100	23.390	\$2,850	109,247
Verio	2.965	2.775	3.140	12.804	1.132	37.844	\$1,400	91,194
VisiNet	3.990	3.815	4.330	10.681	1.135	30.322	\$1,200	108,431
Vnet	4.870	4.355	6.200	16.504	1.424	40.481	\$1,850	108,670
WinStar GoodNet	4.255	4.110	4.555	9.417	1.108	26.338	\$1,900	108,254
ZipLink	2.765	2.540	3.315	9.791	1.305	29.253	\$1,500	109,157
AVERAGES	3.365	3.224	3.700	10.206	1.151	30.271	\$1,858.06	108,088
TOTALS								3,674,986

Backbones		Average	Standard	Ratio	Price Deviation
AUG/SEP '97	34	10.370	64.902	4.97	\$1,940
DEC/JAN '98	39	6.317	17.545	2.77	\$1,852
APR/MAY '98	34	10.206	30.271	2.97	\$1,858

We have annotated these data distribution graphs to show the number of data points, median download time, average download time, and finally the percentage of measurements that fell within the band of 0 to 5 seconds. This is an entirely arbitrary band of performance we magically deem "desirable" and of no other import. But broadly, a network that will produce a 5 second download 83 percent of the time is likely to render a better experience more consistently than one that can do so 45 percent or 70 percent of the time. Again, the median value is simply that value where half the data points in the set are greater and half the data points are lesser.

Networks with higher peaks further left would be better performers. With regards to median values, IDT with a median value of 1.840 seconds just edged out MCI with 1.845 seconds to capture the top spot.

#### **SUMMARY GRAPHS**

In addition to individual backbone graphs showing performance over time and distribution, the summary graphs compare values between backbones. Summary graphs compare average download time, median download time, standard deviation, and price.

Standard deviation is a common statistical device. But in this case we think it indicates a key value with regards to what we think of network elasticity or performance under load. It provides an indication of the degree of variance - in this case theoretically driven by various loads during the day but also by variations between cities. A lower standard deviation would indicate more consistent performance across a variety of times and locations.

The average price of a T-1 connection continues to drop slowly but steadily. There have been many reports over the past year of backbone level companies attempting to raise pricing substantially. Broadly, the experiment failed. Bandwidth will continue to fall in price despite enormous increases in demand. The average "quoted" price of a 1.544 Mbps, T-1 dedicated leased line is currently \$1,858.06 per month. Prices range from GeoNet's low of \$1,050 per month to

IBM's insistence on \$3,000 as the proper price point at the high end. Note that not only do these prices vary greatly from vendor to vendor, but the prices quoted are for a one year contract term T-1. There exists an enormous array of discounts for long term contracts of two to five years, multiple location discounts, "we like you" discounts, "we don't like you" penalties, etc.

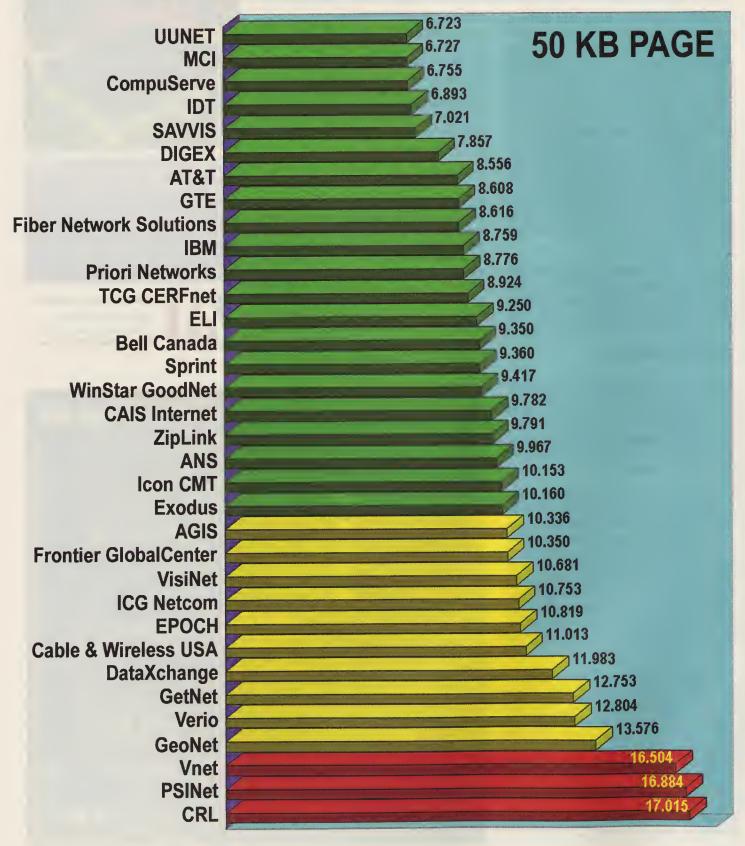
#### **RESULTS**

MCI quoted us a price of \$1,850 per month - a fairly dramatic decrease from their recent positions. They were second place in both average download and median download times - by a few thousandths of a second to two different competitors, topped the standard deviation list, and almost define average price. For this series of measurements, we are going to name internetMCI the best value and best overall performer among Internet backbones, for the period April 26 to May 26, 1998. ◆

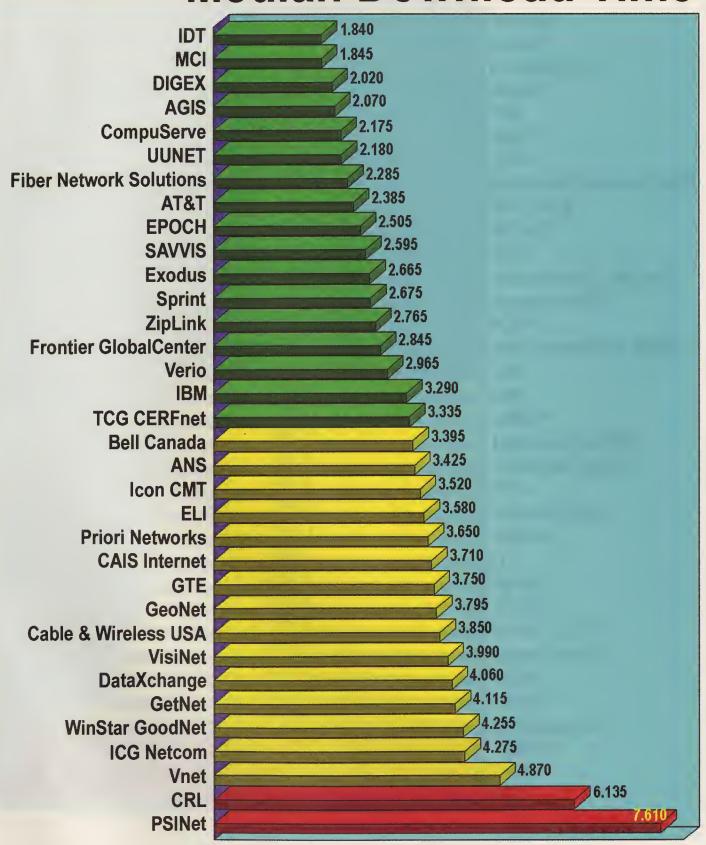




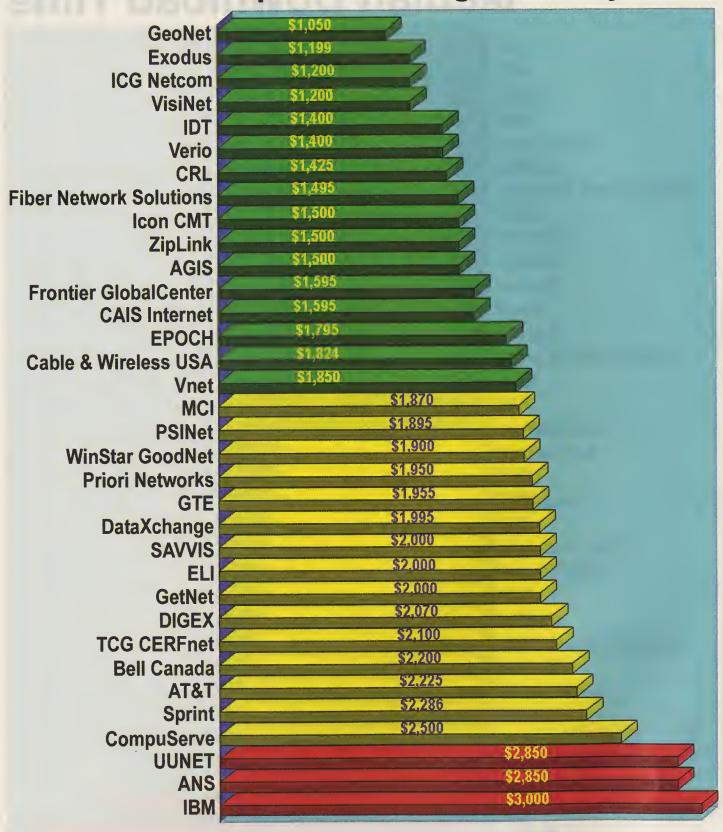
# **AVERAGE DOWNLOAD TIME**



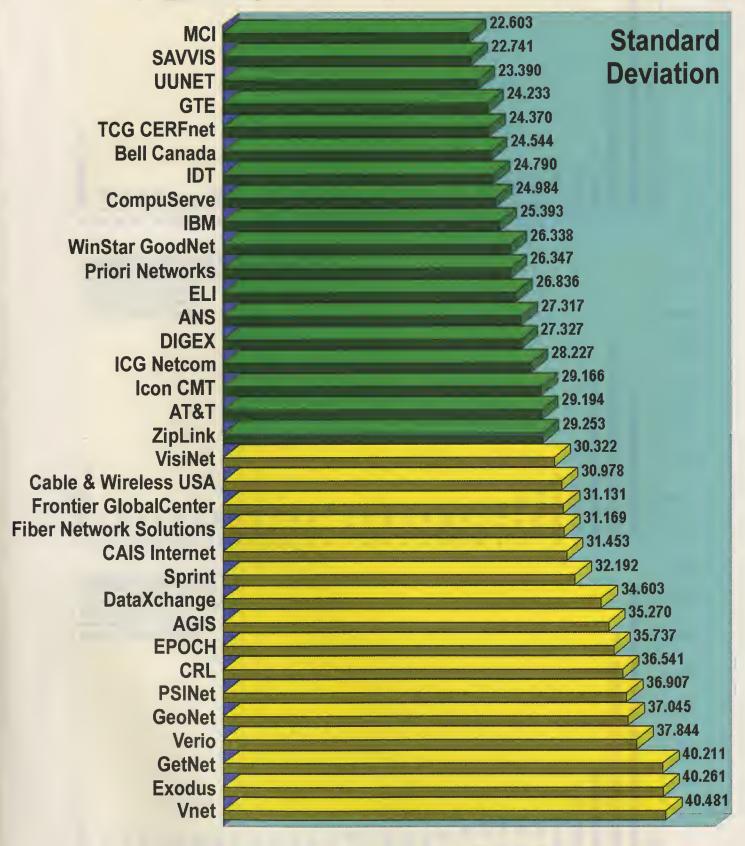
# Median Download Time

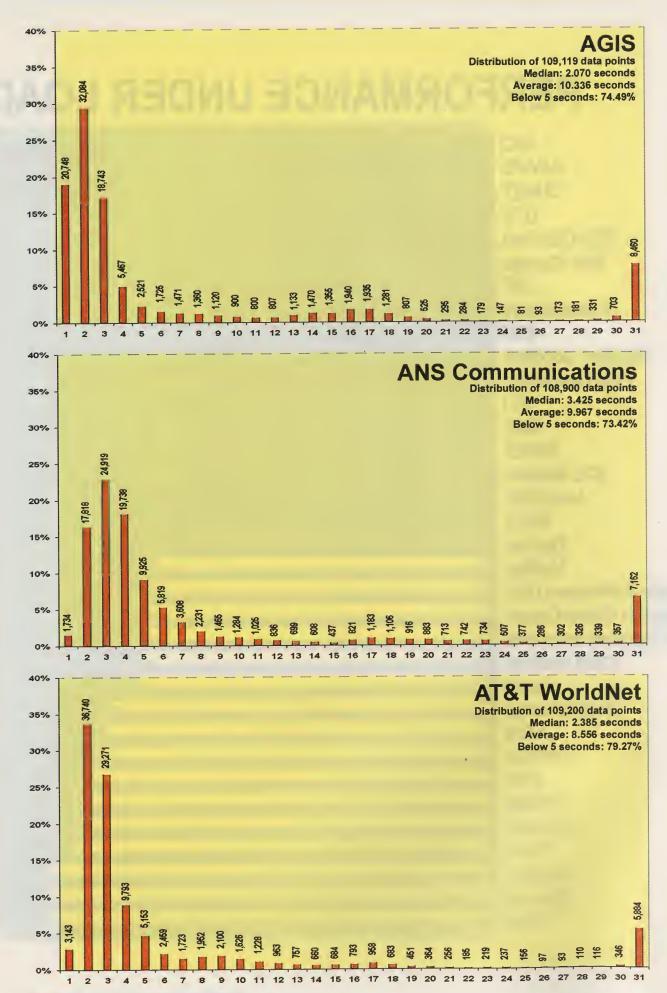


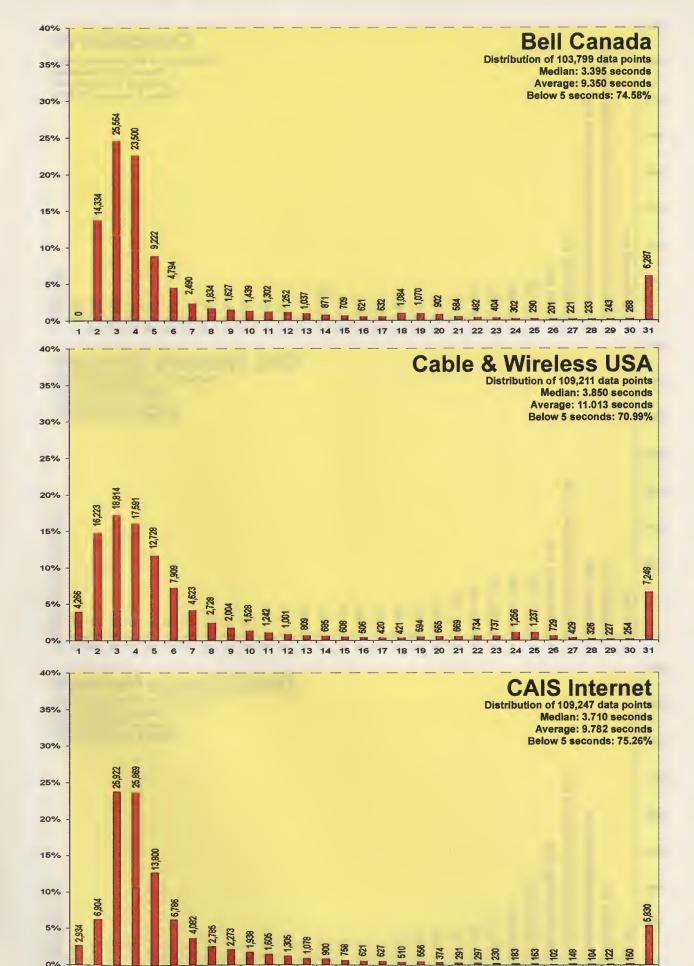
# 1.544 Mbps T-1 Average Monthly Cost



# PERFORMANCE UNDER LOAD



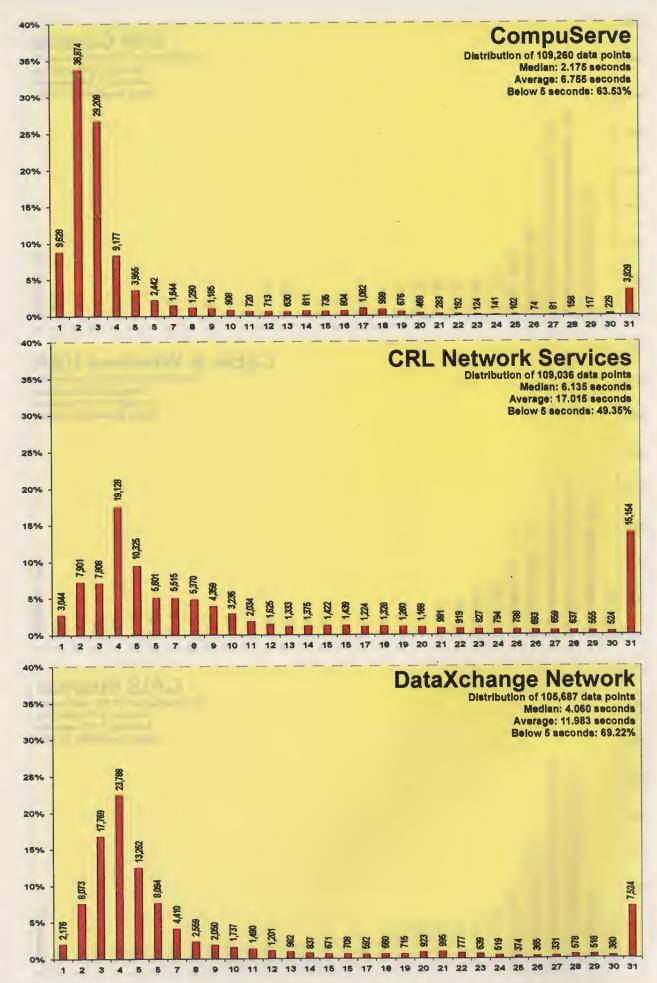


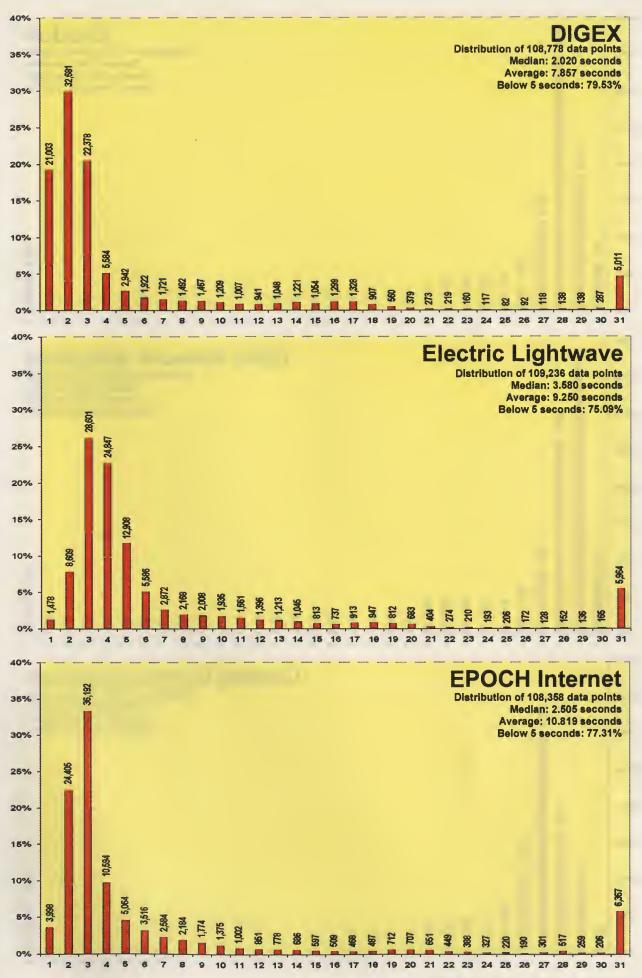


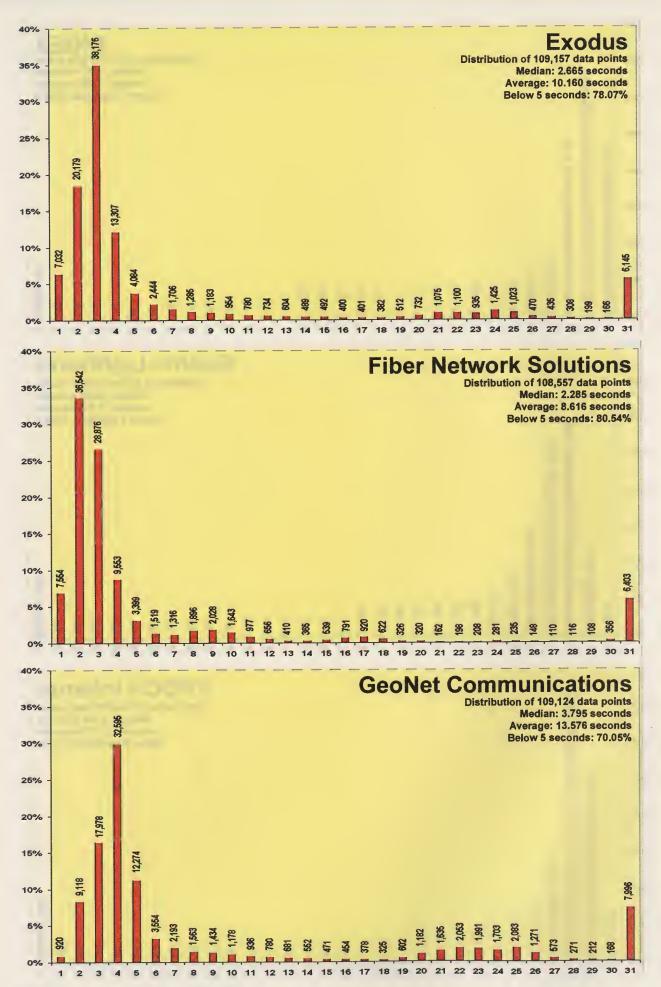
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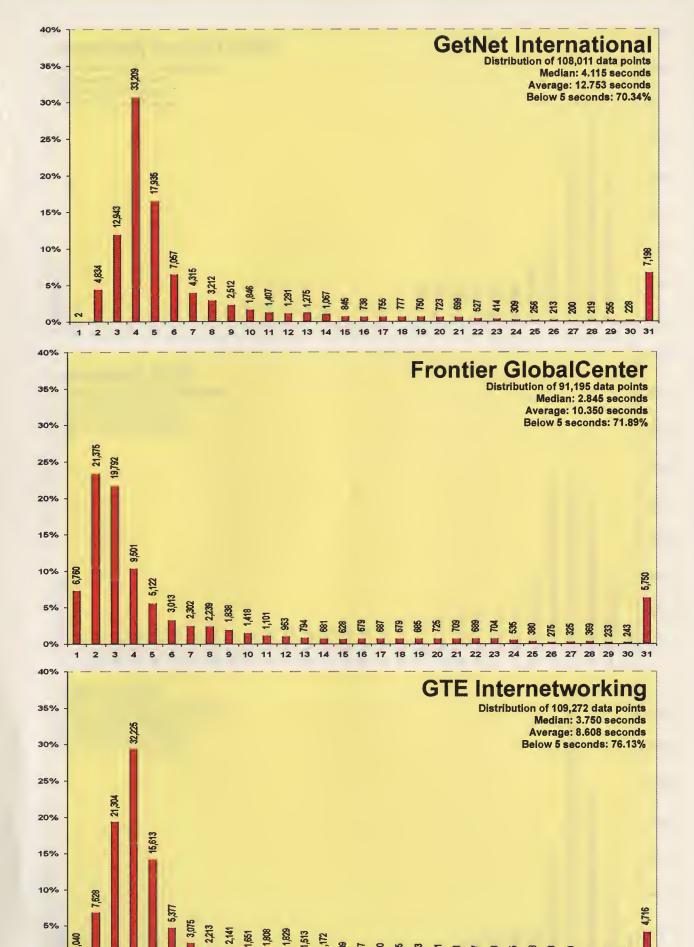
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11 12 13 14 15 16 17 18 19 20





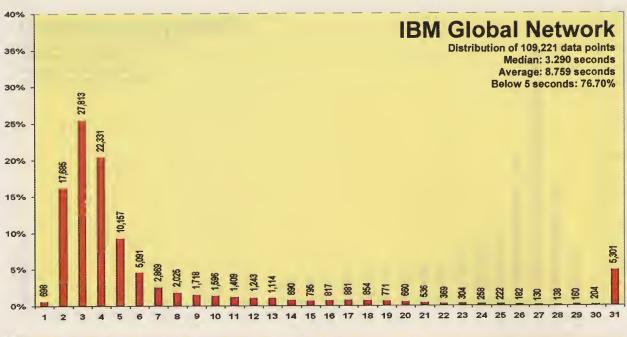


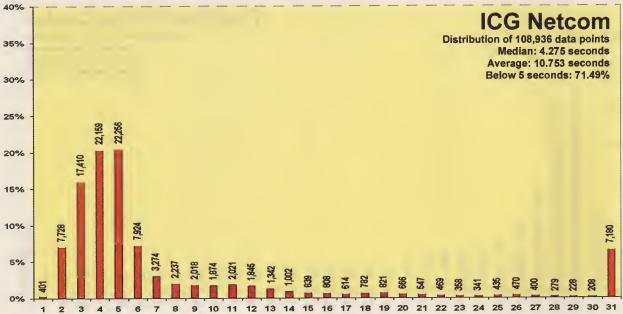


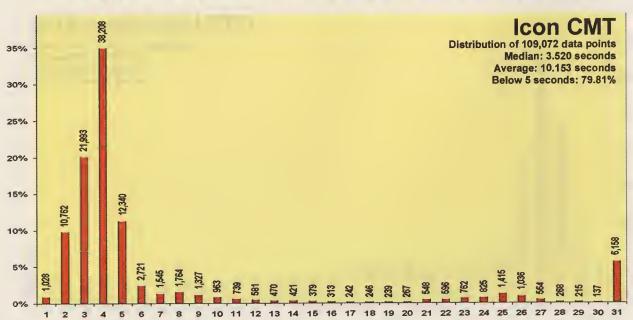
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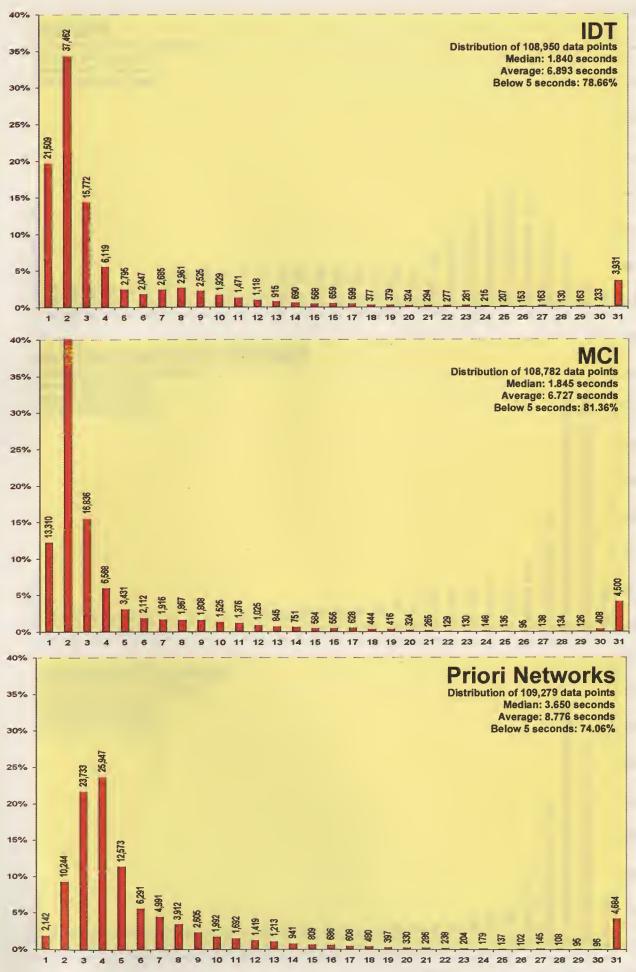
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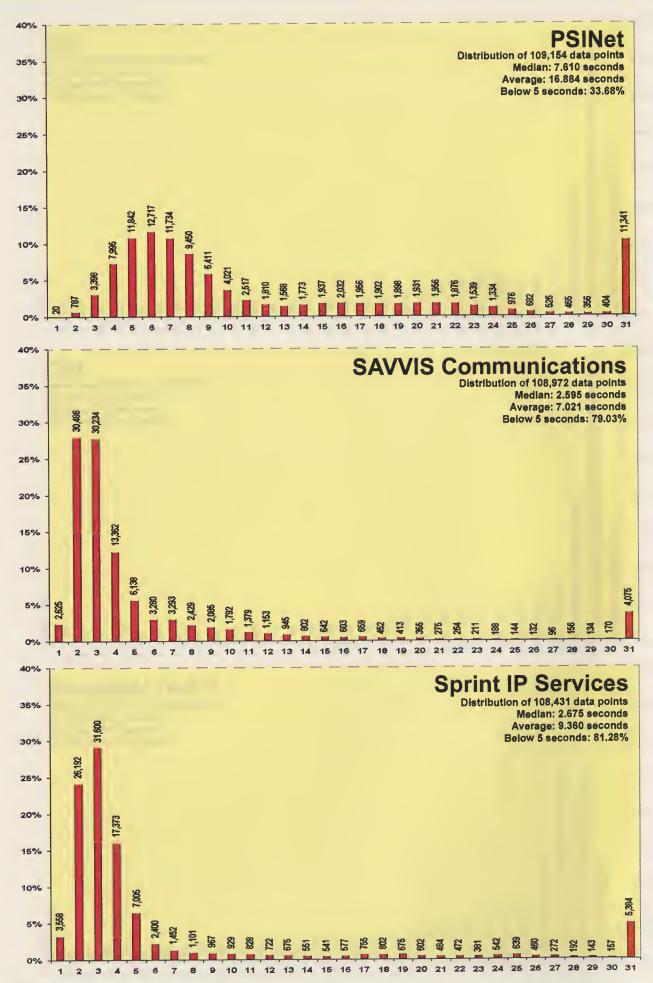
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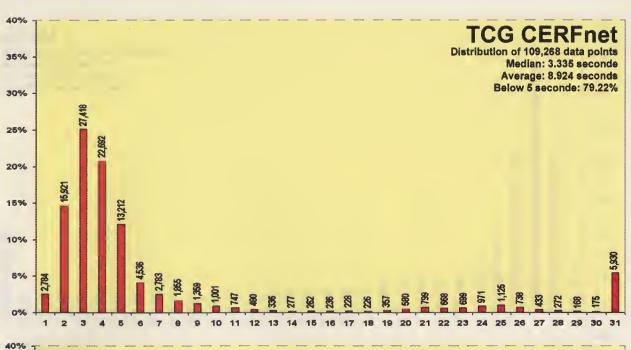


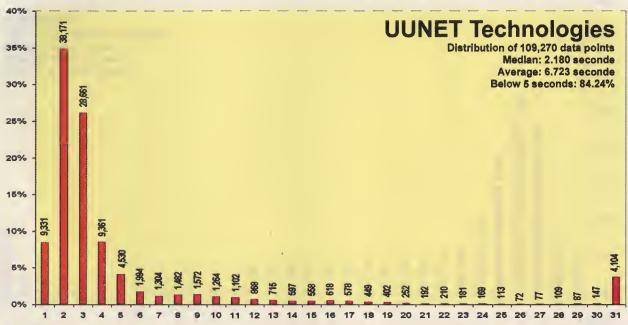


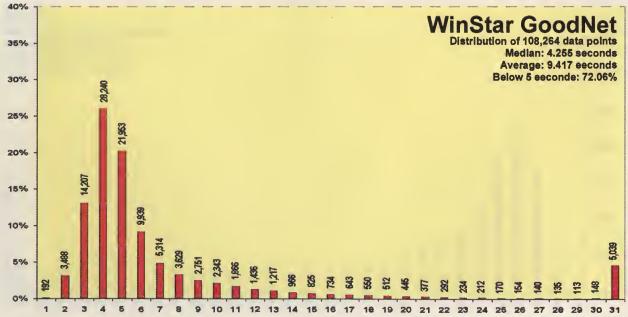


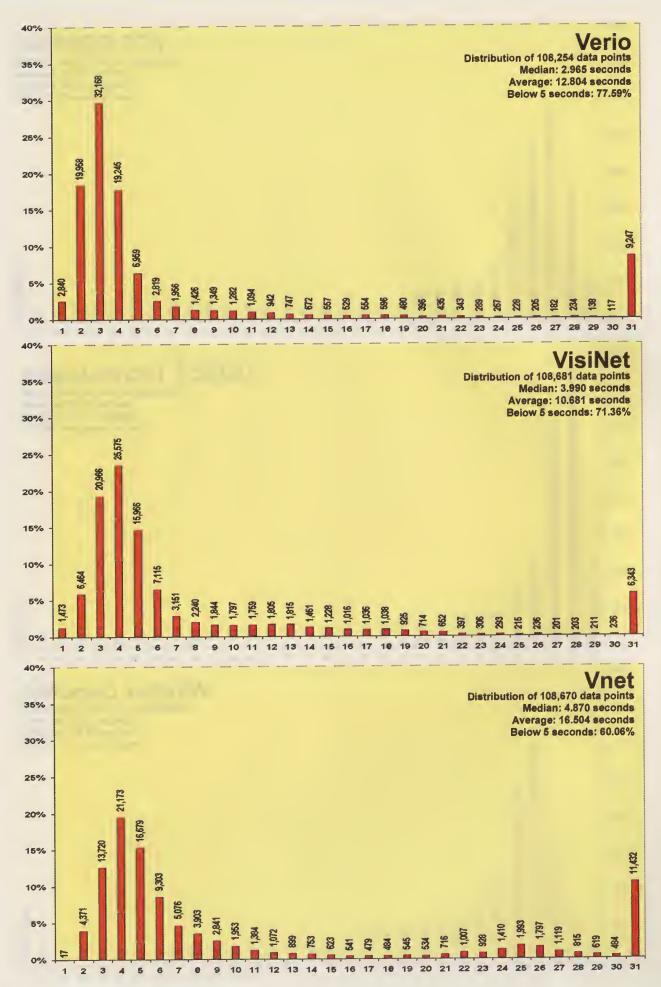


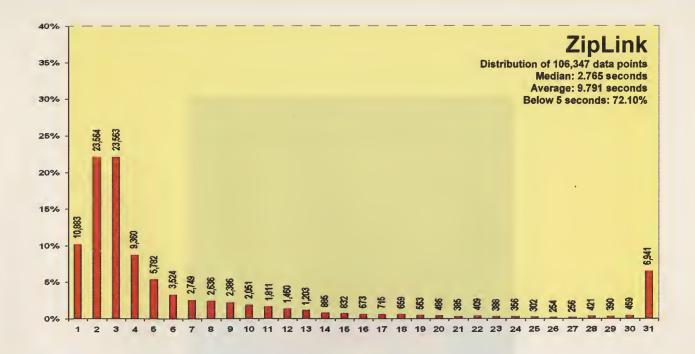


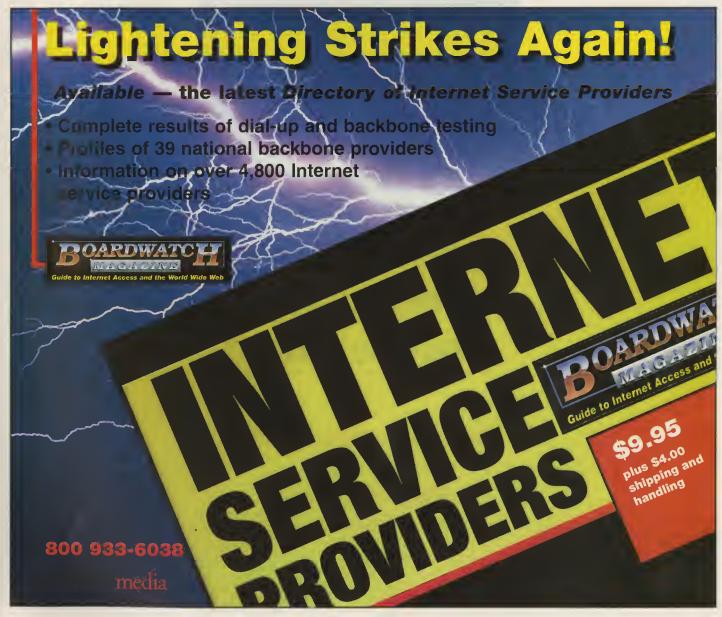














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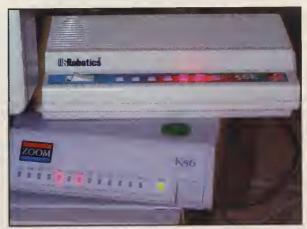
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#### **IUNE 1998 CALL COMPLETION RATE** TESTING OF 110 NATIONAL DIAL-UP INTERNET SERVICE PROVIDERS.

By Jack Rickard and Todd Erickson



hen all is said and done about xDSL, cable modems, DirectPC satellite transmissions, and other exotic methods of delivering high-speed bandwidth to the home, unfortunately, for the near term there is likely to be a lot more said than done. Dial-up access remains the most popular Internet connection option for those at home - largely due to cost and familiarity. You can use your existing analog voice telephone line to make the connection and monthly fees for the dial-up account run typically from \$15 to \$25 per month for essentially unlimited access. Frequent users quickly find the value of a dedicated second analog telephone line for Internet access. Again these tend to run \$12 to \$15 per month, bringing the total cost to something between \$30 and \$35 per month for an e-mail account and the ability to surf the Web at will, albeit somewhat slowly.

Currently, the most commonly cited reason for switching Internet Service Providers is the occurrence of busy signals. ISPs have a finite number of dial-up ports available at any one time. They add additional ports more or less continuously as their business grows, but managing the number of ports available to the current subscriber base is a challenge.

Ideally, they strive for ratios of 8 to 12 users per modem port and experience has shown that the ideal operating ratio lies somewhere in this range. With almost all ISPs, you are effectively sharing ports with other subscribers. With a sufficiently large number of ports on a hunt group, this works pretty well statistically, and all subscribers are able to dial in and get on the network at will.

At 10 subscribers per port, the average monthly income of the ISP is around \$200 per port - sufficient to cover their costs for the telephone line, which can be as high as \$75 per month for digital lines, the hardware, bandwidth upstream, and their administrative expenses and profit. If they can sustain a ratio of 14 subscribers per line, that income per port rises to about \$300 per month. So the ratio of callers per port is an extreme variable determining profitability of the ISP. At the same time, ratios above 12 callers per port usually result in some percentage of callers receiving a busy signal.

Management of this ratio can be problematical and becomes complex quite beyond the basic underlying economics. If a report appears in a magazine or newspaper citing an ISP as a particularly good value, the ISP will likely experience a sudden and unexpected influx of new customers. Installation of additional equipment can take days or even weeks. It is often impossible to get more lines from the local telco in a timely fashion, and ordering equipment from hardware manufacturers can cause further delays.

All data indicates that this is the number one cause of customers leaving one ISP to establish an account with another. But it's not an easy problem for ISPs to manage. To do it effectively, they pretty much have to know precisely how many customers they will have - six months from now. This is a level of crystal ball gazing that can be maddening to master.

But the situation is not easy for dial-up customers either. The inability to get on a service advertised as unlimited when you need to check your electronic mail or investment portfolio can be infuriating. Worse, if you change to another ISP, which usually involves changing your e-mail address at a minimum, you have no indication other than word of mouth from other users that the situation will be better. It could in fact be worse. And finally, you can change ISPs, get better service, and in fact the ISP is doing so well that a lot of others change to their service as well - moving the problem in a fashion we term "rushing to the rail." Hey guys, the GOOD part of the Titanic is over HERE.

In March, we published the results of our first call completion tests in the Boardwatch Directory of Internet Service Providers. In January, some 90 "national" service providers with footprint in at least 25 area codes were dialed in five different cities. Over a hundred thousand calls were made during the 4 p.m. to 10p.m. primetime and all call results logged to a database.

In simplest form, call completion rate indicates the incidence of busy signals for a specific provider. A call completion rate of 95 percent then means that for each 100 calls attempted by subscribers, 95 will get a successful connection and five will not due to busy signals, timeouts, no answers, etc. Obviously a call completion rate of 95 percent would be preferable to a call completion rate of 87 percent. These call completion rates were produced by dialing at least ten different POPs from each service provider, and dialing them hundreds of times during the course of a month's testing.

Of somewhat lesser importance is average connect speed. This was the connect speed reported by the modems during the test process. Typically, ISPs with newer equipment will produce higher average connect speeds. But this is somewhat confused by the current situation with K56flex, x2, and V.90 modems. Indeed, some of the ISPs tested had K56flex ports, x2 ports, and normal V.34 ports. Others were not even experimenting with the higher speed ports yet and offered all V.34 ports. It's interesting information, if not terribly useful at this point.

In looking at what an end user sees, with much of the software there is not actually an indication of a busy signal. They don't get connected. It might be a busy signal, it might be a no-answer, and it might be that the two modems simply failed to negotiate the initial handshake. Some do this better than others. Some ISPs actually guarantee no busy signals. And indeed they almost never issue one. The dial-hunt group simply rolls over to a couple of lines with no modems on them at all and the call just rings with no answer. In any event, the way Windows 95 handles the calls, the end users don't really get much of an indication of just what did happen - they just don't get connected.

So we hatched a plot to see just what the situation was with call completion rates to Internet service providers. While not unthinkable, the task of determining how to measure 4,830 Internet service providers will give pause. We decided in the initial round to limit the testing to those ISPs that provide dial-up access on a "national" basis - which of course could again mean anything. So we used the list of ISPs we define as "national" in scope in the Boardwatch Directory of Internet Service Providers. That is, ISPs who do offer some dial-up point-of-presence in at least 25 area codes. This gets us down to 110 national dial-up ISPs for the Fall '98 Directory.

In the testing just completed in June/July 1998, we increased the number of POPs tested per ISP from the five discrete telephone numbers in five cities used in January, to 10 discrete telephone numbers in 10 cities for the current test. We did this from a growing confidence in our dial-test software to generate large numbers of calls, and a sense that call completion rates vary widely depending on metropolitan statistical area. By increasing the number of POPs dial-tested, we hope to present a more accurate picture of call completion rates.

The cities selected vary rather widely as not all ISPs have a POP in all cities, of course. The result was a database of 110 providers and 1,100 POPs. Even this was a little more complicated than it looks. Many "national" ISPs actually lease POP presence from larger providers who wholesale the service, such as UUNET, GTE/BBN, and MCI to name three apparently popular ones. Microsoft Network, for example, leases all its POPs from UUNET. It's further complicated by the fact that a number of these ISPs actually lease it from more than one such provider. MindSpring, for example, has POPs of its own in the Southeast, and also leases POPs from PSINet, as well as some from GTE/BBN. One PSI pop in Billings, Montana, is claimed by no less than 14 of our 110 ISPs. So on a national level, there is a lot of co-mingling of POP body fluids among ISPs. You could actually change ISPs and wind up not just with a similar problem, but the SAME problem - with the same access numbers.

We set up what essentially is a dialing engine. It consists of the database primarily, with three computers and six modems. All of the computers are new 300 MHz Compaq Deskpro's running NT Workstation with two 115 Kbps serial ports each.

After looking around for several months for an off-the-shelf software program that would do the task, we finally gave up and wrote one ourselves. It basically dials ports sequentially out of a common database, logs the result of the call to the database, and moves to the next call. It is a little more advanced than that in that it also helps calculate some averages and running totals, and accounts for time zone differences. We wanted to dial these services during peak times, and to keep the necessary number of calls for meaningful results to a minimum, over a fairly narrow time band. The program dials the POPs from 4 p.m. to 10 p.m. in the time local to the POP itself. So it begins dialing each afternoon at 2 p.m. Colorado time to the East Coast POPs, adds Central Time Zone POPs at 3, then Mountain, then Pacific. It stops dialing East Coast POPs at 8 p.m. here, 10 p.m. Eastern, and so forth across the country. The result is that all POPs are dialed between 4 p.m. and 10 p.m. local time. All calls are made from our new office in Golden, Colorado.

With the x2/K56flex battle still going on, we didn't really want any of the services disadvantaged by the modem we used. So we set it up with a couple of US Robotics modems, and a variety of Hayes Accura, Zoom, Multitech, Diamond Supra, and Motorola modems. And where we noted a port as K56flex or x2 flavored, we would allow ONLY the appropriate modem to dial that entry. Since all six ports dialed out of the same database, this was quite easy to do.

The result was a dialing engine that could crank out about 5,000 test calls per evening, starting at 2 p.m. and ending at midnight here in Denver. Some 138,638 calls were generated during a 27-day period from June 11 to July 7 to the 1,100 different POPs. This is nominally 126 calls per POP or 1,260 calls per ISP tested. Each of the six dialing engines started at random in the database each day, and no attempt was made to assure that all ISPs or all POPs received the same number of test calls.

#### **CALL COMPLETION RATES**

Of the 110 tested ISPs, call completion rates varied from a low of 71.03 percent with Intermedia, which completed 1,145 of 1,612 test calls, to a high of 99.76 percent with WorldKey, which completed an astounding 827 of 829 calls. Overall, 1,165 of 1,270 calls were completed per ISP on average, for an average call completion rate of 91.66 percent.

This is a fairly dramatic improvement over our first test run during January 1998. In that test of some 90 national dial-up service providers, call completion rates averaged 89.06 percent. And the very best that performance leader IBM could muster in that test was a 95.55 percent call completion rate. IBM was ranked third in the current test with a 99.09 percent call completion rate.

There are two plausible explanations for this improvement. It is possible that over time the installation and testing of new equipment has been better overall against the pace of new user demand and call completion rates have truly improved. Were this the case, we would expect dramatic movement among the rankings as some ISPs did better than others.

#### **CALL COMPLETION RATES**

ISP	Dial- phone	Time Zone	Location	Tries	Connect	Busy	NA	Average Connect Speed	First Dialed	Last Dialed	%	flavor
WorldKey	860-418-8600	eastern	Hartford, CT	87	87	0	0	48676.99	6/11/98	7/7/98	100	x2
WorldKey	312-913-6170	central	Chicago, IL	72	72	0	0	49884.71	6/11/98	7/6/98	100	x2
WorldKey	719-327-5940	mountain	Colo. Spgs., CO	92	92	0	0	27417.39	6/11/98	7/6/98	100	
WorldKey	415-495-0294	pacific	San Francisco, CA	96	96	0	0	48693.96	6/11/98	7/6/98	100	x2
WorldKey	214-672-6900	central	Dallas, TX	72	72	0	0	49625.47	6/11/98	7/6/98	100	x2
WorldKey	407-255-4000	eastern	Melbourne, FL	80	79	0	1	48836.73	6/11/98	7/7/98	98.75	x2
WorldKey	804-846-1959	eastern	Lynchburg, VA	80	79	0	1	47705.90	6/11/98	7/7/98	98.75	x2
WorldKey	801-812-5220	mountain	Provo, UT	72	72	0	0	50255.07	6/11/98	7/6/98	100	x2
WorldKey	503-226-7530	pacific	Portland, OR	112	112	0	0	48849.56	6/11/98	7/6/98	100	x2
WorldKey	504-928-6360	central	Baton Rouge, LA	66	66	0	0	49102.53	6/11/98	7/6/98	100	x2
WorldKey				<b>82</b> 9	827	0	2	46618.87			99.76%	x2
Intermedia	212-267-1460	eastern	New York, NY	195	108	0	92	24200.00	6/11/98	7/7/98	55.38	
Intermedia	315-422-0217	eastern	Syracuse, NY	195	109	0	89	24770.64	6/11/98	7/7/98	55.89	
Intermedia	518-437-0425	eastern	Albany, NY	196	112	0	85	24385.71	6/11/98	7/7/98	57.14	
Intermedia	617-859-0032	eastern	Boston, MA	197	112	0	86	26185.71	6/11/98	7/7/98	56.85	
Intermedia	716-855-0767	eastern	Buffalo, NY	195	110	0	86	26160.00	6/11/98	7/7/98	56.41	
Intermedia	903-794-7131	central	Texarkana, AR	149	149	0	0	23323.49	6/11/98	7/7/98	100	
Intermedia	318-491-1199	central	Lake Charles, LA	148	129	1	18	23516.28	6/11/98	7/7/98	87.16	
Intermedia	602-640-6096	mountain	Phoenix, AZ	86	83	0	4	33103.61	6/11/98	7/6/98	96.51	K56flex
Intermedia	714-450-0955	pacific	Irvine, CA	126	120	0	6	37173.33	6/11/98	7/6/98	95.23	K56flex
Intermedia	206-812-1155	pacific	Seattle, WA	125	113	7	5	33076.11	6/11/98	7/6/98	90.4	K56flex
Intermedia				1612	1145	8	471	27344.98			71.03%	K56flex

#### 110 NATIONAL SERVICE PROVIDERS BY CALL COMPLETION RATE JUNE 11 - JULY 7, 1998

ISP	Tries	Connect	Busy	NA	Speed	Complete	Flavo
orldkev.net Incorporated	829	827	0	2	46619	99.76%	x2
obalynk Internet Solutions, Inc	1753	1742	1	10	26784	99.37%	V.34
Internet Connection Services	879	871	1	8	43336	99.09%	x2
mpus Networks	1928	1909	5	14	25580	99.01%	V.34
ean Solutions, Inc.	842	833	5	4	49039	98.93%	x2
et Internet Access	815	806	2	7	48224	98.90%	x2
S	802	792	1	10	46423	98.75%	x2
ormation Bridge, Inc.	875	862	8	6	46919	98.51%	x2
ntier GlobalCenter	1801	1774	13	34	26887	98.50%	Mixed
	848	835	11	3	49016	98.47%	x2
us.net	819	806	6	8	45872	98.41%	x2
permax Communications		845	3	11	48946	98.37%	x2
gine.com, Inc.	859	1376	6	21	30826	98.22%	x2
SNET	1401				26075	98.10%	V.34
ΓE.Net	1890	1854	5	33	47293	98.04%	v.34 x2
vtonNet	815	799	11	5		97.98%	V.34
sSurf Nationwide Access	1634	1601	7	28	25486		
RYNET	1762	1726	15	23	26790	97.96%	Mixed
oNet	1906	1867	9	34	25654	97.95%	V.34
rld Web Internet Services, Inc.	782	765	7	10	48558	97.83%	x2
tocol Communications	423	413	0	11	43743	97.64%	x2
America, Inc.	1293	1260	8	26	29730	97.45%	K56flex
ay Networks, Inc.	850	827	17	7	49078	97.29%	x2
bNet, Inc.	1606	1562	30	15	29048	97.26%	K56flex
stsound Communications, Inc.	1764	1714	41	9	27846	97.17%	K56flex
sinet, Inc.	1282	1244	1	41	33468	97.04%	K56flex
npuServe Network Services	1844	1789	4	55	25865	97.02%	V.34
erica Online	956	926	8	26	39911	96.86%	Mixed
stian Living Network	942	911	9	23	41531	96.71%	Mixed
erZone Network Services, LLC	1445	1396	37	15	28802	96.61%	K56flex
net Corporation	893	862	13	18	43556	96.53%	Mixed
IdWide Interlink	1136	1094	16	30	28489	96.30%	Mixed
Netcom	1566	1508	4	62	26562	96.30%	V.34
	1052	1013	0	41	38276	96.29%	K56flex
Internetworking	1451	1392	42	21	30690	95.93%	K56flex
olina Online		1232	36	22	30335	95.58%	K58flex
ngton Software Exchange	1289		29	7	48655	95.58%	x2
On America	814	778			18544	95.29%	V.34
phi Internet Services	1679	1600	15	79	37511	95.29%	K56flex
NET Technologies, Inc.	1011	962	22	32	3/511	95.15%	Xallocu

Ground Zer0 Communications, Inc. Institute for Global Communications J997 J948 JAOS J996 J477 J478 J478 J478 J478 J477 J479 J478 J478 J477 J479 J478 J478 J478 J478 J478 J478 J478 J478	t Busy	NA	Speed	Complete	Flavor
nstitute for Global Communications	30	10	48507	95.10%	x2
ASS   996   947   343   345	19	32	38379	95.09%	K56flex
ASLINK    1417	27	23	31931	95.08%	K56flex
EK Interactive Group, Inc.   912   864     RL Network Services   1860   1761     IGT Telecommunications Corp   884   833     800Access   881   830     WinNet Communications, Inc.   1096   1031     Idicro-Net Online Services   1449   1362     Sprint   1629   1530     PM Enterprises, LLC   984   923     PM Enterprises, LLC   984   923     PM Enterprises, ILC   984   923     PM Enternet Now, Inc.   1230   1149     Leke's General Store, Inc.   1212   1131     WinWeb Internet Services   1486   1386     Winyle Internet Services   1486   1386   1386     Whole Earth Networks   1169   1090     White the tentral   1721   1597     BS Co. WebPamp   1612   1494     LarthLink Network, Inc.   1097   1015     Bis Co. WebPamp   1612   1494     LarthLink Network, Inc.   1097   1015     Dictorinet Communications   1144   1056     Spoch Internet   1305   1204     Inter Corp.   1304   1203     Lagrant Software, Inc.   1120   1033     Lagrant Software, Inc.   1120   1033     Lagrant Software, Inc.   1539   1413     Lagrant Software, Inc.   1539   1413     Lagrant Software, Inc.   1539   1413     Lagrant Software, Inc.   1525   1396     Lagrant Software, Inc.   1526   1420     Lagrant Software, Inc.   1527   1398     Lagrant Software, Inc.   1528   1398     Lagrant Software, Inc.   1528   1398     Lagrant Software, Inc.   1529   1398     Lagrant Software, Inc.   1525   1396     Lagrant Software, Inc.   1525   1396     Lagrant Software, Inc.   1476   1330     Lagrant Software, Inc.   1472   1285     Lagrant Software, Inc.   1472   1285     Lagrant So	42	37	30322	94.78%	K56flex
ICI Telecommunications Corp   884   833   830     Monote Communications, Inc.   1096   1031     Minicro-Net Online Services   1449   1362     print   1629   1530     PM Enterprises, LLC   984   923     YCI Internet Services   1218   1140     ternet Now, Inc.   1230   1149     ternet Now, Inc.   1230   1149     ternet Row, Inc.   1212   1131     MyWeb Internet Services   1486   1386     Mole Earth Networks   1169   1090     +Net   1132   1054     ternet Central   1721   1597     IBS Co. WebRamp   1612   1494     arthLink Network, Inc.   1097   1015     ternet Communications   1144   1056     poch Internet   1305   1204     net Corp.   1304   1203     open to Software, Inc.   1539   1413     outhwest Regional Internet Sves.   1419   1300     lashNet Communications   1092   1000     hapel Services Network, Inc.   1539   1413     outhwest Regional Internet Sves.   1419   1300     lashNet Communications   1092   1000     hapel Services Network, Inc.   1525   1396     Si Internet   1366   1249     ludsonNet Internet Sves.   1250   1142     lightal Letralamment, Inc.   1435   1300     onnections, Inc.   1476   1330     OAST.net   1924   1729     yestems Solutions   1092   1077     USA,COM   1655   1481     uston Net Internet Sves.   149   1300     lashNet Internet Sves.   1476   1330     OAST.net   1924   1729     yestems Solutions   1505   1351     utrice.com   1424   1277     USA,COM   1655   1481     utrice.com   1424   1277     USA,COM   1655   1481     utrice of the Sves.   168   1992     yestems Solutions   1444   1274     Usa,Com   1665   1429     utrice of the Sves.   168   1992     Usa, Communications   1638   1427     rodigy Services   1300   1396   1396     utrice, Communications   1638   1427     rodigy Services   1300   1396   1392     Usa, Communications   1447   1200     oval Internet Sves.   168   1992     Usa, Communications   1447   1200     oval Internet Sves.   168   1992     Usa, Communications   1447   1200     oval Internet Sves.   168   1992     Usa, Communications   1447   1200     oval Inte	16	32	42754	94.74%	x2
800Access	10	103	25854	94.68%	V.34
VinNet Communications, Inc.         1096         1031           filoro-Net Online Services         1449         1362           print         1629         1530           IPM Enterprises, LLC         984         923           YCV Internet Services         1218         1140           heteret Now, Inc.         1230         1149           Leke's General Store, Inc.         1212         1131           WhyWeb Internet Services         1486         1386           Whole Earth Networks         1169         1090           WHYWeb Internet Central         1721         1597           LESCO, WebPlamp         1612         1494           ratrib Link Network, Inc.         1097         1015           Aller Corner         1305         1094           dicronet Cormunications         1144         1056           poch Internet         1305         1204           riet Corp.         1304         1203           Stag Todribuser, Inc.         1120         1033           TSTAT WorldNet         1655         1524           Uffordable Access         1103         1015           strigadon-com Inc.         1539         1413           southwest Regional Internet	32	19	46197	94.23%	x2
Micro-Net Online Services	33	20	43523	94.21%	Mixed
Sprint   1629   1530   179M Enterprises, LLC   984   923   179M Enterprises, LLC   984   923   923   179M Enterprises   1218   1140   1149   1240	18	50	37275	94.07%	K56flex
\( \frac{\text{VPM} Enterprises, LLC \ \text{VPC} Internet Services \ 1218 \ 1140 \ 1140 \ 1200 \ 1149 \ 1200 \ 1149 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1449 \ 1200 \ 1440 \ 1200 \ 1440 \ 1200 \ 1440 \ 1200 \ 1440 \ 14	70	18	30150	94.00%	Mixed
Available   1248   1440   14	55	49	27253	93.92%	Mixed
Internet Now, Inc.   1230	30	32	37281	93.80%	K56flex
Ceke's General Store, Inc.   1212	0	84	33426	93.60%	K56flex
ViryWeb Internet Services         1486         1386           Vhole Earth Networks         1169         1090           LeNet         1132         1054           LeNet         1132         1054           LeNet         1132         1054           Lenet Central         1721         1597           Last Converted         1997         1015           Last Converted Communications         1144         1056           Epoch Internet         1305         1204           Incord Corp.         1304         1203           Logent Software, Inc.         1120         1033           T&T WorldNet         1655         524           Lifordable Access         1103         1015	26	60	31453	93.41%	K56flex
Vhole Earth Networks         1169         1090           Land Itemet Central         1132         1054           Itemet Central         1721         1597           IBS Co./WebRamp         1612         1494           CarthLink Network, Inc.         1097         1015           Licronet Communications         1144         1056           Epoch Internet         1305         1204           net Corp.         1304         1203           Logent Software, Inc.         1120         1033           T&T WorldNet         1655         1524           Infordable Access         1103         1015           Italian Communications         1092         1000           Italian Communications         1092	56	25	32350	93.32%	K56flex
Helter titered central termet Central 1721 1597 1595 Co./WebRamp 1612 1494 1494 1494 1494 1495 1615 1615 1615 1615 1615 1615 1615 16	74	29	29582	93.27%	K56flex
Internet Central 1721 1597 1612 1494 1728 Co./WebRamp 1612 1494 1728 Co./WebRamp 1612 1494 1494 1616 1612 1494 1728 1728 1729 1729 1729 1729 1729 1729 1729 1729	43	40	36171	93.24%	Mixed
1612   1494	39	46	34174	93.11%	K56flex
CarthLink Network, Inc.   1097   1015	56	77	26199	92.79%	V.34
CarthLink Network, Inc.   1097   1015	102	21	29270	92.68%	K56flex
Alteronet Communications	53	38	35964	92.53%	K56flex
Epoch Internet	56	33	37206	92.31%	Mixed ·
The Corp.   1304   1203   20gent Software, Inc.   1120   1033   178	80	36	33568	92.26%	K56flex
Cogent Software, Inc.         1120         1033           AT&T WorldNet         1655         1524           Affordable Access         1103         1015           Brigadoon.com Inc.         1539         1413           Southwest Regional Internet Svcs.         1419         1300           FlashNet Communications         1092         1000           Chapel Services Network, Inc.         1525         1396           JS Internet         1366         1249           HudsonNet Internet Svcs.         1250         1142           Lighthouse Productions         1401         1276           Digital Entertainment, Inc.         1435         1300           Connections, Inc.         1476         133           Oyber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1331           Surfere.com         1424         1277           IOAST.net         1403         1257           I USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           IeleSouth Network, Inc.         1444         1274           Ovager Online LLC <t< td=""><td>34</td><td>70</td><td>30492</td><td>92.25%</td><td>K56flex</td></t<>	34	70	30492	92.25%	K56flex
ATTÄT WorldNet  Affordable Access  I 103  Affordable Access  I 1419  I 300  ClashNet Communications  1092  1000  Chapel Services Network, Inc.  I 525  I 396  I 249  I 366  I 249  I 49  I 404  I 250  I 142  Ighthouse Productions  I 401  I 276  I 250  I 142  Ighthouse Productions  I 401  I 276  I 250  I 142  I 250  I 142  I 260  I 276  I 281  I 290  I 292  I 293  I 294  I 729  I 294  I 729  I 294  I 729  I 294  I 297  I 294  I 297  I 294  I 277  I 295  I 297  I	40	51	33593	92.23%	K56flex
Affordable Access Affordable A	35	116	26538	92.08%	Mixed
Brigadoon.com Inc.         1539         1413           Southwest Regional Internet Svcs.         1419         1300           IslashNet Communications         1092         1000           Chapel Services Network, Inc.         1525         1396           JS Internet         1366         1249           HudsonNet Internet Svcs.         1250         1142           Lighthouse Productions         1401         1276           Ighthouse Productions         1401         1276           Spaterne.         1435         1300           Kornections, Inc.         1476         1330           Systems Solutions         1505         1331           Surface.com         1924         1729           Systems Solutions         1505         1331           Surface.com         1424         1277           OAST.net	52	38	36818	92.02%	K56flex
Southwest Regional Internet Svcs.	108	23	29092	91.81%	K56flex
TashNet Communications   1092   1000	99	22	30854	91.61%	K56flex
Chapel Services Network, Inc.         1525         1396           JS Internet         1366         1249           JudsonNet Internet Svcs.         1250         1142           JudsonNet Internet Svcs.         1250         1142           Lighthouse Productions         1401         1276           Digital Entertainment, Inc.         1435         1300           Konnections, Inc.         1476         1330           Syber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1351           Surfree.com         1424         1277           IOAST.net         1403         1257           IUSA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           SeleSouth Network, Inc.         1444         1274           Judrageous Internet         1120         988           Jova Internet Svcs. Inc.         1399         1231           Japital City Cyberlink         1371         1203           Jovajea Assoc. Communications         1638         1427           Podingy Services         930         808           Alicrosoft <td< td=""><td>15</td><td>83</td><td>36716</td><td>91.58%</td><td>K56flex</td></td<>	15	83	36716	91.58%	K56flex
US Internet   1366   1249	104	28	29580	91.54%	K56flex
HudsonNet Internet Svcs.   1250	91	30	30729	91.43%	K56flex
lighthouse Productions         1401         1276           ligital Entertainment, Inc.         1435         1300           Connections, Inc.         1476         1330           Cyber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1351           Surfree.com         1424         1277           TOAST.net         1403         1257           USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           feleSouth Network, Inc.         1444         1274           Jurgaeous Internet         1120         988           Jova Internet Svcs. Inc.         1399         1231           Japital City Cyberlink         1371         1203           Joyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Alicrosoft         1081         937           Jorneal LC         1472         1285           Concentric Network Corp.         1557         1338           IngressNet LLC         1396         11	79	32	31346	91.36%	K56flex
Digital Entertainment, Inc.         1435         1300           Connections, Inc.         1476         133           Oxber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1331           Surfree.com         1424         1277           IOAST.net         1403         1257           I USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           GleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Vova Internet Svcs. Inc.         1399         1231           Zapital City Cyberlink         1371         1203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comentric Network Corp.         1557         1338           OppressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         99	100	27	30835	91.08%	K56flex
Connections, Inc.         1476         1330           Cyber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1351           Surfree.com         1424         1277           IOAST.net         1403         1257           I USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           FeleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Capital City Cyberlink         1371         1203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comm2         1656         1429           Comm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2	105	35	29513	90.59%	K56flex
Cyber Realm         1112         1000           Akronet         1924         1729           Systems Solutions         1505         1351           Surfree.com         1424         1277           TOAST.net         1403         1257           I USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           FeleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Capital City Cyberlink         1371         203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Domm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           2 LINN Network One         1096         928	124	23	29242	90.11%	K56flex
Akronet 1924 1729 Systems Solutions 1505 1331 Surfree.com 1424 1277 COAST.net 1403 1257 COAST.net 1403 1257 COAST.net 1403 1257 CUSA.COM 1655 1481 Shadow Information Svcs. Inc. 1262 1120 CifeleSouth Network, Inc. 1444 1274 Dutrageous Internet 1120 988 Allowa Internet Svcs. Inc. 1399 1231 Capital City Cyberlink 1371 1203 Alloyager Online LLC 1472 1285 Clavis & Assoc. Communications 1638 1427 Crodigy Services 930 888 Alforsoft 1081 937 Connentric Network Corp. 1557 1338 Concentric Network Corp. 1557 1338 Concentric Network Corp. 1320 1127 Cow Herd Internet Svcs. 1168 992 SLINN Network One 1096 928 City Online Communications 1447 1220 Considered Systems 1447 1220 Considered Sys	78	38	30534	89.93%	K56flex
Systems Solutions   1505   1351	188	9	26672	89.86%	V.34
Suffree.com         1424         1277           IOAST.net         1403         1257           I USA.COM         1655         1481           Shadow Information Svcs. Inc.         1262         1120           TeleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Capital City Cyberlink         1371         1203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           2ILINN Inc.         1465         1213           MindSpring Enterprises, Inc.         1105         909           Nationwide Internet         1019         83	87	74	29821	89.77%	K56flex
TOAST.net 1403 1257 1 USA.COM 1655 1481   Shadow Information Svcs. Inc. 1262 1120   TeleSouth Network, Inc. 1444 1274   Outrageous Internet 1120 988   Nova Internet Svcs. Inc. 1399 1231   Capital City Cyberlink 1371 1203   Voyager Online LLC 1472 1285   Oavis & Assoc. Communications 1638 1427   Prodigy Services 930 888   Microsoft 1081 937   Comm2 1656 1429   Concentric Network Corp. 1557 1338   IngressNet LLC 1396 1192   IDT Corp. 1320 1127   2 Cow Herd Internet Svcs. 1168 992   GILNN Network One 1096 928   City Online Communications 1447 1220   PSINet, Inc. 1465 1213   MindSpring Enterprises, Inc. 1105 909   Nationwide Internet   Internet Zap 893 725   LinkEASY Network, Inc. 1632 1323   VEI Internet Hotline 1073 860   Deniz Corporation 991 794   StarNet, Inc. 1037 820   PYPOtechnics, Inc. 1015 799   Internet Hotline 1073 860   Deniz Corporation 991 794   StarNet, Inc. 1037 820   PYPOtechnics, Inc. 1015 789   Internet Hotline 1073 860   Deniz Corporation 991 794   StarNet, Inc. 1037 820   PYPOtechnics, Inc. 1015 789   Network Data Link, Inc. 1030 783	117	33	28096	89.68%	K56flex
USA.COM	105	45	30712	89.59%	K56flex
Shadow Information Svcs. Inc.         1262         1120           TeleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Zapital City Cyberlink         1371         1203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Commal         1656         1429           Commal         1656         1429           Commal         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           City Online Communications         1447         1220           PSINet, Inc.         1465         1213           MindSpring Enterprises, Inc.         1105         909           Nationwide Internet         1019         834           nternet Zap         893         725 <td>165</td> <td>17</td> <td>28217</td> <td>89.49%</td> <td>K56flex</td>	165	17	28217	89.49%	K56flex
TeleSouth Network, Inc.         1444         1274           Outrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Capital City Cyberlink         1371         1203           Voyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comnecentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           2 LINN Network One         1096         928           2ity Online Communications         1447         1220           2SINEI, Inc.         1465         1213           WindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           nternet Zap         893         725           LinkEASY Network, Inc.         1632         1323           VEI Internet         1019         825           Planet Systems         88	106	44	33159	88.75%	Mixed
Dutrageous Internet         1120         988           Nova Internet Svcs. Inc.         1399         1231           Capital City Cyberlink         1371         1203           Joyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Pricrosoft         1081         937           Commentic Network Corp.         1557         1338           OppressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           2Ity Online Communications         1447         1220           PSINEt, Inc.         1465         1213           WindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           nternet Zap         893         725           LinkEASY Network, Inc.         1632         1323           VEI Internet         1019         825           Palanet Systems         881         712           nternet Hotline         1073	141	30	30055	88.23%	K56flex
Nova Internet Svcs. Inc.   1399   1231	52	90	36855	88.21%	K56flex
Capital City Cyberlink         1371         1203           Joyager Online LLC         1472         1285           Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           2 LINN Network One         1096         928           City Online Communications         1447         1220           PSINet, Inc.         1465         1213           WindSpring Enterprises, Inc.         1105         909           Nationwide Internet         1019         834           Internet Zap         893         725           LinkEASY Network, Inc.         1632         1323           VEI Internet         1019         825           Planet Systems         881         712           Internet Hotline         1073         860           Deniz Corporation         991         794	154	16	30152	87.99%	K56flex
Voyager Online LLC         1472         1285           Javis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Domentic Network Corp.         1557         1338           Joncentric Network Corp.         1557         1338           JongressNet LLC         1396         1192           DT Corp.         1320         1127           Vow Herd Internet Svcs.         1168         992           JLINN Network One         1096         928           City Online Communications         1447         1220           2SINet, Inc.         1465         1213           WindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           Internet Zap         893         725           VEI Internet         1019         825           Planet Systems         881         712           Planet Systems         881         712           Deniz Corporation         991         794           StarNet, Inc.         1037         820           PYPOtechnics, Inc.         1018         799     <	136	36	31927	87.75%	K56flex
Davis & Assoc. Communications         1638         1427           Prodigy Services         930         808           Microsoft         1081         937           Comm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           2LINN Network One         1096         928           2LINN Inc.         1465         1213           VindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           nternet Zap         893         725           LinkEASY Network, Inc.         1632         1323           /EI Internet         1019         825           Planet Systems         881         712           nternet Hotline         1073         860           Deniz Corporation         991         794           StarNet, Inc.         1037         820           2YROtechnics, Inc.         1018         799 <t< td=""><td>174</td><td>15</td><td>28800</td><td>87.30%</td><td>K56flex</td></t<>	174	15	28800	87.30%	K56flex
Prodigy Services         930         808           Alicrosoft         1081         937           Comm2         1656         1429           Concentric Network Corp.         1557         1338           ngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           2Ity Online Communications         1447         1220           2SINet, Inc.         1465         1213           AlindSpring Enterprises, Inc.         1105         909           Nationwide Internet         1019         834           nickEASY Network, Inc.         1632         1323           I/El Internet         1019         825           Planet Systems         881         712           Internet Hottline         1073         860           Deniz Corporation         991         794           StarNet, Inc.         1018         799           The Young Company         1015         789           Vetwork Data Link, Inc.         1030         783	194	23	29946	87.12%	K56flex
Alicrosoft         1081         937           Domm2         1656         1429           Concentric Network Corp.         1557         1338           IngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           2 LINN Network One         1096         928           2 Illy Online Communications         1447         1220           2 SlNet, Inc.         1465         1213           MindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           Internet Zap         893         725           InkEASY Network, Inc.         1632         1323           I/El Internet         1019         825           Planet Systems         881         712           Internet Hotline         1073         860           Deniz Corporation         991         794           StarNet, Inc.         1018         799           The Young Company         1015         789           Hetwork Data Link, Inc.         1030         783	94	29	44326	86.88%	x2
Comm2         1656         1429           Concentric Network Corp.         1557         1338           IngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           City Online Communications         1447         1220           2SINet, Inc.         1465         1213           WindSpring Enterprises, Inc.         1105         909           Vationwide Internet         1019         834           nternet Zap         893         725           inkEASY Network, Inc.         1632         1323           /EI Internet         1019         825           Planet Systems         881         712           nternet Hotline         1073         860           Deniz Corporation         991         794           StarNet, Inc.         1037         820           2YROtechnics, Inc.         1018         799           The Young Company         1015         789           vetwork Data Link, Inc.         1030         783	129	21	36328	86.68%	K56flex
1557   1338   1396   1192	187	45	28664	86.29%	K56flex
IngressNet LLC         1396         1192           DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           2 LINN Network One         1096         928           2ity Online Communications         1447         1220           PSINet, Inc.         1465         1213           InidSpring Enterprises, Inc.         1105         909           Nationwide Internet         1019         834           Internet Zap         893         725           InkEASY Network, Inc.         1632         1323           I/El Internet         1019         825           Planet Systems         881         712           Internet Hotline         1073         860           Deniz Corporation         991         794           StarNet, Inc.         1037         820           PYROtechnics, Inc.         1018         799           The Young Company         1015         789           Vetwork Data Link, Inc.         1030         783	125	98	28463	85.93%	Mixed
DT Corp.         1320         1127           2 Cow Herd Internet Svcs.         1168         992           3LINN Network One         1096         928           2Ity Online Communications         1447         1220           YSINet, Inc.         1465         1213           MindSpring Enterprises, Inc.         1105         909           Vaitionwide Internet         1019         834           Internet Zap         893         725           LinkEASY Network, Inc.         1632         1323           VEI Internet         1019         825           Planet Systems         881         712           Internet Hotline         1073         860           Poeniz Corporation         991         794           StarNet, Inc.         1037         820           PYROtechnics, Inc.         1018         799           The Young Company         1015         789           Vetwork Data Link, Inc.         1030         783	185	22	31486	85.39%	K56flex
2 Cow Herd Internet Svcs.       1168       992         3LINN Network One       1096       928         3LINN Network One       1096       928         3LINN Network One       1447       1220         2SINet, Inc.       1465       1213         JinkSpring Enterprises, Inc.       1105       909         Jationwide Internet       1019       834         nternet Zap       893       725         JinkEASY Network, Inc.       1632       1323         /EI Internet       1019       825         Planet Systems       881       712         nternet Hotline       1073       860         Deniz Corporation       991       794         StarNet, Inc.       1037       820         VPROtechnics, Inc.       1018       799         The Young Company       1015       789         Vetwork Data Link, Inc.       1030       783	27	174	30323	85.38%	K56flex
SLINN Network One   1096   928	114	69	36163	84.93%	K56flex
City Online Communications     1447     1220       PSINEI, Inc.     1465     1213       MindSpring Enterprises, Inc.     1105     909       Mationwide Internet     1019     834       Internet Zap     893     725       InkEASY Network, Inc.     1632     1323       Palanet Systems     881     712       Planet Systems     881     712       Internet Hotline     1073     860       Poeniz Corporation     991     794       StarNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       The Young Company     1015     789       Vetwork Data Link, Inc.     1030     783	120	57	36828	84.67%	K56flex
2SÍNet, Inc.     1465     1213       AlindSpring Enterprises, Inc.     1105     909       Alationwide Internet     1019     834       Anternet Zap     893     725       LinkEASY Network, Inc.     1632     1323       VEI Internet     1019     825       Planet Systems     881     712       Internet Hotline     1073     860       Deniz Corporation     991     794       StarNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       The Young Company     1015     789       Vetwork Data Link, Inc.     1030     783	186	43	29479	84.31%	K56flex
MindSpring Enterprises, Inc.     1105     909       Jationwide Internet     1019     834       nternet Zap     893     725       inkEASY Network, Inc.     1632     1323       /EI Internet     1019     825       Planet Systems     881     712       nternet Hotline     1073     860       Deniz Corporation     991     794       StarNet, Inc.     1037     820       YPROtechnics, Inc.     1018     799       The Young Company     1015     789       letwork Data Link, Inc.     1030     783	214	49	29457	82.80%	K56flex
lationwide Internet     1019     834       nternet Zap     893     725       inkEASY Network, Inc.     1632     1323       /EI Internet     1019     825       vlanet Systems     881     712       nternet Hotline     1073     860       beniz Corporation     991     794       starNet, Inc.     1037     820       VPROtechnics, Inc.     1018     799       ne Young Company     1015     789       letwork Data Link, Inc.     1030     783	173	25	38492	82.26%	x2
Section   Sect	113	76	38979	81.84%	K56flex
.inkEASY Network, Inc.     1632     1323       //El Internet     1019     825       planet Systems     881     712       planet Hottine     1073     860       peniz Corporation     991     794       starNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       Phe Young Company     1015     789       vetwork Data Link, Inc.     1030     783	79	93	38729	81.19%	k56flex
/EI Internet     1019     825       Ianet Systems     881     712       Iternet Hotline     1073     860       Jeniz Corporation     991     794       StarNet, Inc.     1037     820       YROtechnics, Inc.     1018     799       The Young Company     1015     789       Ietwork Data Link, Inc.     1030     783	280	32	28863	81.07%	K56flex
Planet Systems     881     712       Internet Hotline     1073     860       Joeniz Corporation     991     794       StarNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       The Young Company     1015     789       Ide Work Data Link, Inc.     1030     783	141	58	39106	80.96%	K56flex
Internet Hotline     1073     860       Jeniz Corporation     991     794       StarNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       The Young Company     1015     789       Jetwork Data Link, Inc.     1030     783	117	62	37706	80.82%	K56flex
Deniz Corporation     991     794       StarNet, Inc.     1037     820       PYROtechnics, Inc.     1018     799       The Young Company     1015     789       Network Data Link, Inc.     1030     783	153	69	38113	80.15%	K56flex
StarNet, Inc.         1037         820           PYROtechnics, Inc.         1018         799           The Young Company         1015         789           vetwork Data Link, Inc.         1030         783	124	83	38634	80.12%	K56flex
PYROtechnics, Inc.         1018         799           The Young Company         1015         789           Network Data Link, Inc.         1030         783	151	73	39180	79.07%	K56flex
The Young Company         1015         789           Network Data Link, Inc.         1030         783	136	73 91	38396	79.07% 78.49%	K56flex
Network Ďata Link, ľnc. 1030 783		68	38558	77.73%	K56flex
	162				K56flex
	163	89	38898	76.02%	K56flex
ntermedia Communications 1812 1145	8	471	27345	71.03%	Rapilex
Fotals 138638 127143	7279	4670	34523	91.71%	

But the improvement was fairly uniform across the test universe. Which leads us to favor the second explanation - all the users were gone to the beach in June, while they were using the

Internet in January. If so, we've probably bracketed the problem in testing in January and June - we would hazard the most active and least active months on the Internet respectively.

ISP	Dialphone	Time Zone	Location	Tries	Connect	Busy	NA	Average Connect Speed	First Dialed	Last Dialed	%	Flavor
I-Way	206-287-9805	pacific	Seattle, WA	93	84	9	0	48656.70	6/11/98	7/6/98	90.32	x2
I-Way	303-820-0320	mountain	Denver, CO	69	66	3	0	48621.89	6/11/98	7/6/98	95.65	x2
I-Way	515-262-5778	central	Des Moines, IA	72	70	0	2	49005.33	6/11/98	7/6/98	97.22	x2
I-Way	212-267-4040	eastern	New York, NY	86	84	1	1	48961.51	6/11/98	7/7/98	97.67	x2
I-Way	561-471-7360	eastern	West Palm Beach, FL	86	83	0	4	47125.72	6/11/98	7/7/98	96.51	x2
I-Way	805-323-0358	pacific	Bakersfield, CA	109	109	0	0	49572.59	6/11/98	7/6/98	100	x2

ISP	Dialphone	Time Zone	Location	Tries	Connect	Busy	NA	Average Connect Speed	First Dialed	Last Dialed	%	Flavor
I-Way	626-938-1420	pacific	Covina, CA	108	108	0	0	49130.41	6/11/98	7/6/98	100	x2
I-Way	901-661-9776	eastern	Jackson, TN	80	80	0	0	49409.54	6/11/98	7/7/98	100	x2
I-Way	405-280-7840	central	Oklahoma City, OK	75	71	4	0	50080.28	6/11/98	7/7/98	94.66	x2
I-Way	801-812-5220	mountain	Provo, UT	72	72	0	0	50255.07	6/11/98	7/6/98	100	x2
I-Way				850	827	17	7	49077.52			97.29%	x2
Delphi	719-594-2090	mountain	Colorado Springs, CO	157	151	6	0	27568.21	6/11/98	7/6/98	96.17	
Delphi	303-291-4016	mountain	Denver, CO	155	128	5	24	28875.00	6/11/98	7/6/98	82.58	
Delphi	805-322-2100	pacific	Bakersfield, CA	114	103	4	. 7	37467.96	6/11/98	7/6/98	90.35	K56flex
Delphi	515-288-4626	central	Des Moines, IA	157	153	0	4	15262.75	6/11/98	7/6/98	97.45	
Delphi	978-459-2350	eastern	Lowell, MA	165	138	0	39	14747.83	6/16/98	7/7/98	83.63	
Delphi	205-328-5719	central	Birmingham, AL	164	163	0	1	14856.44	6/11/98	7/7/98	99.39	
Delphi	310-306-3450	pacific	Marina Del Ray, CA	225	224	0	1	14239.29	6/11/98	7/6/98	99.55	
Delphi	704-332-4023	eastern	Charlotte, NC	188	188	0	0	14655.32	6/11/98	7/7/98	100	
Delphi	402-341-4622	central	Omaha, NE	165	163	0	3	14826.99	6/11/98	7/7/98	98.78	
Delphi	812-235-5671	eastern	Terre Haute, IN	189	189	0	0	14806.35	6/11/98	7/7/98	100	
Delphi			7	1679	1600	15	79	18543.75	-		95.29%	V.34

#### **AVERAGE CONNECT SPEED**

Connect speeds averaged 34,523 bps and ranged from a low of Delphi's 18,544 bps to a high of 49,078 bps for I-Way. I-Way had 3COM/USRobotics equipment running x2/V.90 on all ten selected POPs. Delphi appears to have V.34 or earlier equipment on all but one of its tested lines.

The average connect speed is actually of limited usefulness. The testing is necessarily a snapshot in time. ISPs are in various stages of deployment of 56Kbps technology. As a result, our random selection of 10 POPS could result in all ten numbers being served by K56flex equipment, all ten numbers by x2 equipment, some combination of older V.34 equipment and x2 or K56flex, and in some cases by ISPs that provide POPS for K56flex, x2 and V.90. The resulting averages are of all ten POPs combined.

In general, x2 and the 3Com/USR V.90 provided much better reported connect speeds again. During our first test, there was some comment that this was due to our physical location, the specific telephone company central office, the equipment used at the telco CO, our analog lines to the CO, and the digital padding from the CO to the long-distance carrier - Sprint.

As it so happens, we moved in May. We now have a new office in a different city here in the Denver area, with an entirely different teleco central office, different analog lines to the CO, different type of CO equipment, and a different padding structure to Sprint (-6dB). The results were not even minutely statistically different from our story in March.

We had hoped to test the new V.90 implementations. Unfortunately, at the time of the test, not a SINGLE Rockwell based modem had the promised V.90 software upgrade available in any form. The 3Com/US Robotics modems did receive the V.90 software upgrade, and as best we could tell, it was an improvement in every way over the earlier x2 implementation. They now transmit what is referred to as a "bong tone" consisting of all 256 PCM codes as the test signal, detect what happens over the live circuit through the digital PADs used to decrease amplitude, and automatically correct for this. It appears to work quite well.

But given the mix of hardware supporting POP at most ISPs, the average connect speed has somewhat limited value in most comparisons for ISPs. The best way to maximize connect speed is to select an ISP with a LOCAL POP using the flavor of 56Kbps modem you have. ◆

## 110 NATIONAL SERVICE PROVIDERS BY CONNECT SPEED JUNE 11 - JULY 7, 1998

ISP	Tries	Connect	Busy	NA	Speed	Complete	Flavor
I-Way Networks, Inc.	850	827	17	7	49078	97,29%	X2
Berean Solutions, Inc.	842	833	5	4	49039	98.93%	X2
Getus.net	848	835	11	3	49016	98.47%	X2
magine.com, Inc.	859	845	3	11	48946	98.37%	X2
Log On America	814	778	29	7	48655	95.58%	X2
Vorld Web Internet Svcs., Inc.	782	765	7	10	48558	97.83%	X2
Ground Zero Communications, Inc.	816	776	30	10	48507	95.10%	X2
/net Internet Access	815	806	2	7	48224	98.90%	X2
awtonNet	815	799	11	5	47293	98.04%	X2
nformation Bridge, Inc.	875	862	8	6	46919	98.51%	X2
Vorldkey.net, Inc.	829	827	0	2	46619	99.76%	X2
cvs	802	792	1	10	46423	98.75%	X2
ACI Telecommunications Corp.	884	833	32	19	46197	94.23%	X2
Cybermax Communications	819	806	6	8	45872	98.41%	X2
Prodigy Services	930	808	94	29	44326	86.88%	X2
Protocol Communications	423	413	.0	11	43743	97.64%	X2
Ntr.net Communications	893	862	13	18	43556	96.53%	Mixed
800Access_	881	830	33	20	43523	94.21%	Mixed X2
BM Global Services	879	871	1	8	43336	99.09%	X2
EK Interactive Group, Inc.	912	864	16	32 23	42754 41531	94.74% 96.71%	Mixed
Christian Living Network	942	911	9	23	41531	96./1%	MINEC

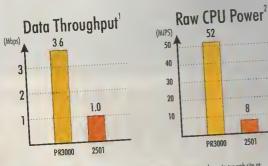
ISP	Tries	Connect	Busy	NA	Speed	Complete	Flavor
America Online	956	926	8	26	39911	96.86%	Mixed
StarNet, Inc.	1037	820	151	73	39180	79.07%	K56flex
VEI Internet	1019	825	141	58 76	39106 38979	80.96% 81.84%	K56flex K56flex
Nationwide Internet	1019	834 783	113 163	76 89	38898	76.02%	K56flex
Network Data Link, Inc.	1030 893	763 725	79	93	38729	81.19%	k56flex
Internet Zap Deniz Corporation	991	794	124	83	38634	80.12%	K56flex
The Young Company	1015	789	162	68	38558	77.73%	K56flex
MindSpring Enterprises, Inc	1105	909	173	25	38492	82.26%	X2
PYROtechnics, Inc.	1018	799	136	91	38396	78.49%	K56flex K56flex
Institute for Global Communications	997	948	19 0	32 41	38379 38276	95.09% 96.29%	K56flex
GTE Internetworking	1052 1073	1013 860	153	69	38113	80.15%	K56flex
Internet Hotline Planet Systems	881	712	117	62	37706	80.82%	K56flex
UUNET Technologies, Inc.	1011	962	22	32	37511	95.15%	K56flex
VPM Enterprises, LLC	984	923	30	32	37281	93.80%	K56flex
WinNet Communications, Inc.	1096	1031	18	50	37275	94.07%	K56flex
Micronet Communications	1144	1056	56	33 90	37206 36855	92.31% 88.21%	Mixed K56flex
Outrageous Internet	1120	988	52 120	90 57	36828	84.67%	K56flex
GLINN Network One Affordable Access	1096 1103	928 1015	52	38	36818	92.02%	K56flex
FlashNet Communications	1092	1000	15	83	36716	91.58%	K56flex
Microsoft Network	1081	937	129	21	36328	86.68%	K56flex
Whole Earth Networks	1169	1090	43	40	36171	93.24%	Mixed
2 Cow Herd Internet Svcs.	1168	992	114	69	36163	84.93%	K56flex
EarthLink Network, Inc.	1097	1015	53	38	35964	92.53% 93.11%	K56flex K56flex
A+Net	1132	1054	39 40	46 51	34174 33593	93.11%	K56flex
Cogent Software, Inc.	1120 1305	1033 1204	40 80	36	33568	92.26%	K56flex
Epoch Internet Megsinet, Inc.	1282	1244	1	41	33468	97.04%	K56flex
KYC Internet Services	1218	1140	Ó	84	33426	93.60%	K56flex
Shadow Information Svcs, Inc.	1262	1120	106	44	33159	88.75%	Mixed
Zeke's General Store, Inc.	1212	1131	56	25	32350	93.32%	K56flex
IAOS	996	947	27	23	31931	95.08%	K56flex
Capital City Cyberlink	1371	1203	136	36 22	31927 31486	87.75% 85.39%	K56flex K56flex
IngressNet, LLC	1396 1230	1192 1149	185 26	60	31453	93.41%	K56flex
Internet Now, Inc. HudsonNet Internet Svcs.	1250	1142	79	32	31346	91.36%	K56flex
Southwest Regional Internet Svcs.	1419	1300	99	22	30854	91.61%	K56flex
Lighthouse Productions	1401	1276	100	27	30835	91.08%	K56flex
TDSNET	1401	1376	8	21	30826	98.22%	x2
US Internet	1366	1249	91	30	30729	91.43%	K56flex
TOAST.net	1403	1257	105	45	30712 30690	89.59% 95.93%	K56flex K56flex
Carolina Online	1451 1112	1392 1000	42 78	21 38	30534	89.93%	K56flex
Cyber Realm Fnet	1304	1203	34	70	30492	92.25%	K56flex
Arlington Software	1289	1232	36	22	30335	95.58%	K56flex
IDT Corp.	1320	1127	27	174	30323	85.38%	K56flex
CASLINK	1417	1343	42	37	30322	94.78%	K56flex
Nova Internet Svcs., Inc.	1399	1231	154	16	30152	87.99%	K56flex
Micro-Net Online Svcs.	1449	1362	70	18	30150	94.00% 88.23%	Mixed K56flex
TeleSouth Network, Inc.	1444	1274 1427	141 194	30 23	30055 29946	87.12%	K56flex
Davis & Assoc. Communications, Inc. Systems Solutions	1638 1505	1351	87	74	29821	89.77%	K56flex
Net America, Inc.	1293	1260	8	26	29730	97.45%	K56flex
WhyWeb Internet Svcs.	1486	1386	74	29	29582	93.27%	K56flex
Chapel Services Network, Inc.	1525	1396	104	28	29580	91.54%	K56flex
Digital Entertainment, Inc.	1435	1300	105	35	29513	90.59%	K56flex
City Online Communications	1447	1220	186	43	29479	84.31%	K56flex
PSINet, Inc.	1465	1213	214	49 21	29457 29270	82.80% 92.68%	K56flex K56flex
CBS Co./WebRamp	1612 1476	1494 1330	102 124	21 23	29270 29242	90.11%	K56flex
Konnections, Inc. Brigadoon.com, Inc.	1539	1413	108	23	29092	91.81%	K56flex
WebNet inc.	1606	1562	30	15	29048	97.26%	K56flex
LinkEASY Network, Inc.	1632	1323	280	32	28863	81.07%	K56flex
EnterZone Network Svcs. LLC	1445	1396	37	15	28802	96.61%	K56flex
Voyager Online LLC	1472	1285	174	15	28800	87.30%	K56flex K56flex
Comm2	1656	1429	187	45	28664	86.29% 96.30%	Mixed
WorldWide Interlink	1136	1094 1338	16 125	30 98	28489 28463	96.30% 85.93%	Mixed
Concentric Network Corp. 1 USA.COM	1557 1655	1338	165	17	28217	89.49%	K56flex
Surfree.com	1424	1277	117	33	28096	89.68%	K56flex
Westsound Communications, Inc.	1764	1714	41	9	27846	97.17%	K56flex
Intermedia Communications	1612	1145	8	471	27345	71.03%	K56flex
Sprint	1629	1530	55	49	27253	93.92%	Mixed Mixed
Frontier GlobalCenter	1801	1774	13	34	26887	98.50%	Mixed
SPRYNET	1762	1726	15	23 10	26790 26784	97.96% 99.37%	V.34
Globalynk Internet Solutions, Inc.	1753	1742	1 188	10 9	26/84 26672	89.86%	V.34 V.34
Akronet ICG Netcom	1924 1566	1729 1508	4	62	26562	96.30%	V.34
AT&T WorldNet	1655	1524	35	116	26538	92.08%	Mixed
Internet Central	1721	1597	56	77	26199	92.79%	V.34
LYTE.Net	1890	1854	5	33	26075	98.10%	V.34
CompuServe Network Svcs.	1844	1789	4	55	25865	97.02%	V.34
CRL Network Svcs.	1860	1761	10	103	25854	94.68%	V.34
HoloNet	1906	1867	9	34	25654	97.95%	V.34 V.34
Kampus Networks	1928	1909	5	14 28	25580 25486	99.01% 97.98%	V.34 V.34
LetsSurf Nationwide Access	1634	1601	7	79	25466 18544	95.29%	V.34
Dolphi Internet Succ	1670	1600					
Delphi Internet Svcs.	1679	1600	15	75	10044	00.20 70	1.51

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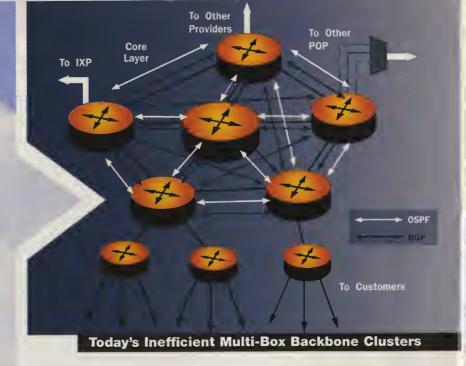
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# ON THE TRAIL TERABIT ROUTING

By Sam Halabi

Sam Halabi is one of the industry's foremost experts in network architecture and design and is the author of Internet Routing Architectures (Cisco Press, 1997), a definitive resource for internetworking design alternatives. Halabi joined Pluris Inc., as director of marketing from Cisco Systems where he led the IP carrier marketing effort. Halabi is an expert in complex routing protocols and has spent more than 10 years specializing in the design of large-scale IP networks. Halabi has held various technical marketing positions at 3Com where he helped corporations and service providers design large networks. Halabi holds an MS in computer science.





#### **CURRENT ROUTER TECHNOLOGY IS FALLING BEHIND**

For more than 20 years Internet traffic has steadily grown at an average monthly rate of 10 percent, or approximately 1,000 times every five years. Commercialization of the Internet has fueled even faster growth of backbone traffic, and over the next decade this exponential increase is expected to continue. Internet communications have mush-roomed from simple text messages exchanged among researchers into a multimedia explosion that threatens the Internet's ability to survive as a mass-market medium.

Backbone routers support this massive transfer of information, controlling and directing this data flow for Internet providers. They are the Internet's "mail sorters" and are rapidly running out of capacity. As more Internet sites suffer bottlenecks due to the lack of router bandwidth, costly leased lines are underutilized and the implementation of new Internet functions, tools and applications is severely inhibited. The first signs of a crisis are everywhere as complaints about poor Internet service reach national news status.

#### FROM THE CORPORATE TO THE CORE

The Internet has simply grown too big, too fast. Equipment that was originally designed for corporate networks has found its way into backbone networks only because ISPs had no other choice. Service providers that are struggling to maintain and grow their customer base do not have the luxury of waiting for the perfect product. On the other hand, trying to get higher-performance products from your leading vendor can become an exercise in threats and arm twisting, often to no avail. The products that are needed are just not available. When it comes to the very high-end products, those needed at the core of the Internet and at the exchange points where hundreds of providers plug in to exchange traffic, the situation becomes more complicated. Using enterprise routers to handle Internet backbone traffic just doesn't work. The core of the Internet is entirely different from enterprise networks in that the least amount of instability can disrupt thousands and millions of critical real-time applications and cause overall performance degradation across the whole Internet. The latest products on the market today have attempted to address the problem but, while they are one step up from enterprise routers, they are also miles away from achieving the performance levels required from a coming generation of Internet backbone routers.

What is really needed is a totally new approach: Internet backbone routers that are designed from the ground up to deal with the scalability, reliability, high availability and manageability required at the core of the Internet. A number of companies are currently designing a new generation of systems designed expressly for the Internet backbone.

#### GLOBAL TOPOLOGY OF THE INTERNET

The Internet is constituted of parallel backbones interconnected via a number of IntereXchange Points (IXPs), also called Network Access Points (NAPs). ISP backbones are a collection of Points of Presence (POPs), each one serving a particular region and where access circuits to customers are concentrated. The POPs connect via high-speed links to other POPs, directly to other service providers, or to IXPs where traffic is exchanged with the rest of the Internet. In essence, POPs and IXPs are Internet concentration points through which millions of user transactions flow and, as such, they bear the brunt of the problems created by traffic growth. Eliminating potential bottlenecks on the Internet can be achieved by building scalable POPs and IXPs. We will focus on the existing problems at these exchange points and how next-generation architectures can help eliminate the performance and reliability issues of current designs.

#### BACKBONE-SCALE CAPACITY VERSUS "MORE BOXES"

With few options and ever-increasing demand, service providers are simply adding more of the same limited-performance, restricted-scalability equipment to their backbones whenever these networks reach a capacity ceiling. This has been the operational model for the last several years. The problem with this approach is that Internet backbones become a collection of independent routers glued together with an ad hoc mesh of older networking designs. To reach the required capacity level at the concentration point, service providers have resorted to building networks within networks. As this process progresses, backbones become inherently less efficient and reliable in direct relationship to the additional connections and software overhead required. Building a reliable backbone demands careful consideration of both physical connectivity and software connectivity.

#### PHYSICAL CONNECTIVITY ISSUES

Physical connectivity in current POP and IXP designs is accomplished with LAN interconnects such as FDDI and ATM, or direct Point-to-Point connections via IP over SONET interfaces. Building a reliable FDDI interconnect, for example, involves dual-homing routers into FDDI switches and building redundant rings. This translates into additional equipment costs, wasted router ports and additional management and operational headaches on the physical layer.

#### LAYER 3 ISSUES

Software connectivity is achieved using routing protocols. Interior Gateway Protocols (IGPs), such as OSPF and ISIS, and exterior gateway protocols, such as the de facto standard Border Gateway Protocol Version 4 (BGP4) are commonly used protocols. Backbone routers at the POP or IXP must exchange IP accessibility information via routing updates in order to build routing tables. IGPs, such as OSPF and ISIS, have never been a good match for meshed topologies or multi-access networks. A sure way to confuse OSPF is to have a router receive the same information from a multitude of neighbors.

BGP is based on building TCP sessions between neighboring routers. BGP exchanges thousands of routes that represent all of the IP prefixes that exist in the Internet. The number of these prefixes has reached approximately 50,000 today and is expected to keep growing due to the enormous number of IP sub-

nets being added every day. BGP is policy driven and requires a high level of manual configuration to ensure proper network design.

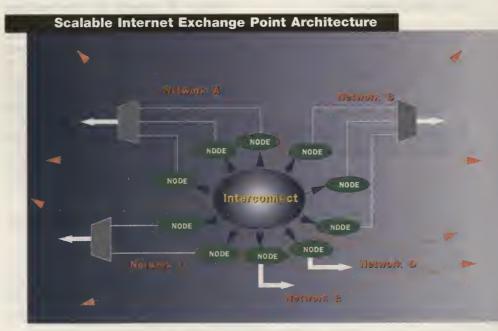
Having multiple router clusters at concentration points translates into additional routing overhead in the form of complex paths between routers and increasing instability at the Layer 3 protocol level.

#### THE MYTH OF LINEAR SCALABILITY

A common misconception about the Internet backbone is that capacity grows linearly with the number of boxes added to the network. This is untrue, however. Connecting a 10-gigabit box to an existing 10-gigabit box does not double the capacity of the network because these boxes are being interconnected via a LAN, and the aggregate capacity of the whole cluster (considered as one system) is at most as high as the capacity of the connecting links. This means that backbone implementations that require communications lines between routers whether done via FDDI. ATM or Point-to-Point translate into bottlenecks that will degrade the overall capacity of the cluster.

#### THE "BIG BANG" APPROACH - A MEDIOCRE SOLUTION

It would seem like the next best approach to the problem would be to build larger boxes with greater capacity. Unfortunately this "big bang" approach will never catch up to the Internet growth and will not satisfy the scalability and reliability requirements. Follo-



wing are some reasons why a single-box approach will simply not work:

Internet Growth Versus Integrated Circuits - The problem facing us is that the Internet is growing at a much faster rate than the performance of Integrated Circuits. The Internet is growing so fast that "Internet Law" or "Gilder's Law" now dictates that Internet traffic will double every three to six months. In comparison, "Moore's Law" states that Integrated Circuit capacity will double every 18 months, not nearly fast enough to enable a single-box approach using even the latest IC designs to handle the growth rate of Internet traffic.

Capacity Meets Reliability - The highcapacity, single-box approach, even if it could somehow reach terabit levels, will not satisfy the density levels and reliability needed in environments such as the core of the Internet.

Due to physical limitations, such as the maximum circuit density of line cards and possible number of line cards per shelf, a single-box solution will have a limited number of physical interfaces. This means that in an environment where hundreds and even thousands of interfaces are needed, multiple boxes are required to support the required number of physical router ports.

On the other hand, packing too many interfaces into a single box can result in an unreliable network vulnerable to a single point of failure. Imagine the core of a major exchange point being built with a single-box router carrying hundreds of interfaces. An outage (either software or hardware) can result in a total network blackout.

It is obvious that what is needed is a system that can grow to satisfy the present and anticipated capacity and density needs, while avoiding the inefficient multi-box LAN cluster design implemented in today's network architectures.

#### BREAKING THE ROUTER PORT CAPACITY BARRIER

Just a short time ago in the evolution of the Internet, the industry's bandwidth bottlenecks were the talk of the town. What happened to the bandwidth crunch that somehow foretold the collapse of the Internet? Today, the industry is awash with talk about more bandwidth than ever thought possible. Thanks to Dense Wave Division Multiplexing (DWDM), a single fiber can now carry 400 Gbps! Furthermore, the breakthroughs in transmission bandwidth do not stop with abundant fiber capacity. WDM vendors are adding more channels to each fiber, which will allow terabits of transmission capacity in the near future.

Ironically, in spite of these breakthroughs in transmission capacity, Internet IP backbones are still running at 622 Mbps (OC-12c) speeds. Only in the last 12 to 18 months have major IP backbone providers upgraded their links from 155 Mbps (OC-3c) to 622 Mbps (OC-12c). Meanwhile, providers still await OC-48c router interfaces to upgrade their backbones to 2.4 Gbps capacity. Currently, service providers are limited by the size of existing router port technology, NOT the actual available capacity of the fiber transmission backbone. As a result, while carriers operate enormous fiber capacity in the ground, IP service providers are hard pressed to match this available bandwidth with comparably high-performance data networking backbones. Instead, they struggle to keep pace with today's box-level solutions and wait for current and/or startup router vendors to deliver needed port capacity in nextgeneration systems.

OC-48 interfaces have been available on SONET multiplexers for some time, and leading transmission vendors have recently introduced OC-192 (10 Gbps) interfaces. Meanwhile, on the routing front, routing vendors have only recently announced OC-48c, while several startups have now joined the race to deliver OC-192c ports. At this pace, the heralded and much anticipated 10 Gbps level of IP capacity for data backbone networks is still 12 to 18 months away. At the Internet's current rate of growth, IP capacity demand on the backbone will soon bypass the OC-192c level to reach into the hundreds of gigabits and beyond. However, even the established routing community's most far-reaching announcements have failed to project a future beyond OC-192c. As a result, the data networking industry has so far been unable to project viable solutions that can bridge today's gap in router port capacity.

#### APPLYING SUPERMARKET LOGIC TO DATA NETWORKS

What can the data networking industry learn from supermarkets, banks and airline terminals? It didn't take long for those industries' service experts to conclude that 50 customers are better served with five checking counters rather than a single counter with a very fast clerk. Yet, the data networking community has so far overlooked this logic when it comes to building advanced switching and routing devices. With the Internet growing so fast, it has become increasingly apparent that data backbone networks can not rely on single devices - even those based on the highest performance semiconductor technologies available. Network operators are coming to understand the advantages of harnessing the enormous growth of IP capacity by distributing the load over multiple smaller entities (the multiple checkers at the supermarket). In fact, the multi-gigabits of backbone traffic are simply an aggregation of thousands of few kilobits per second flows generated primarily by individual PCs and servers. Applying an architecture that uses multiple processors not only offers the most reliable approach but also offers top quality of service to the traffic that needs it the most (your 10 items or less line at the supermarket). Special-purpose processors, offering higher quality service level agreements, can be dedicated to high-priority packets such as voice over IP.

The parallel "supermarket" approach using multiple processors can also be extended to the interface level. Multiple lower-speed lines can be aggregated to generate a higher-speed pipe. Multiple OC-48c and OC-192c interfaces, for example, can be aggregated to generate very high-speed IP pipes. So what is preventing bigger IP pipes today? The OC-12c interface has been on the market for a year now. Why not run multiple pipes between two points and gain greater IP capacity?

Unfortunately, existing software and hardware router architectures were not designed to enable parallel links to efficiently share loads.

On the software side, existing routers maintain a one-to-one mapping between physical interfaces and IP subnets. Routing protocols such as OSPF, ISIS and BGP would treat each parallel interface as a separate IP subnet and would try to establish a neighbor relationship and exchange routes on each subnet. This results in an unnecessary duplication of effort and additional processing cycles on each link. Routing protocols would then decide, based on exchanged link metrics, if these links have equal costs and if so, would treat them as equal

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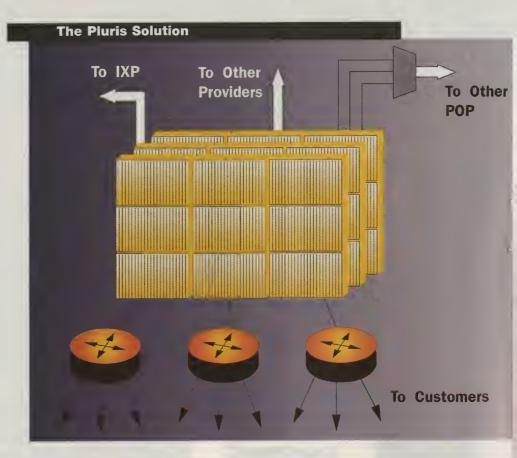
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paths to the same destination. Existing load sharing techniques are very inefficient and either result in packet reordering or uneven distribution of traffic over multiple links. This would result in dropped packets on over-utilized links and lost capacity on underutilized links. Additionally, involving Layer 3 routing in load sharing results in slow convergence upon link failures. A link failure would require routing table exchanges and best route computation before the network stabilizes.

On the hardware side, to take full advantage of the parallel approach, the architecture must scale to handle a high port density without performance limiting bottlenecks. Unfortunately, most router designs on the market are either a single-box approach or are scalable to a finite point, and none are designed to take full advantage of today's enormous fiber capacity. A single-box architecture has a fixed back-plane capacity that is defined by and limited to the single system. Existing bus shared memory, and cross bar architectures are examples of single-box systems. These designs usually offer a port density that is limited by the "real estate" of the box, irrespective of back-plane capacity. A box that can handle 64 OC-48c interfaces, for example, with an aggregate port capacity of 160 Gbps can offer a maximum aggregate IP pipe of 80 Gbps. This assumes the hypothetical situation of an 80 Gbps input pipe and an 80 Gbps output pipe. Interfaces from different "single boxes" cannot be aggregated to form a bigger pipe due to the fact that load sharing between multiple interfaces from mutually exclusive systems is almost impossible to achieve. Hence, the need has arisen for truly scalable architectures that offer more port density across a system with a distributed back-plane.

In even the most advanced software/ hardware routing architecture, the expandability of the internal hardware switch fabric is the primary factor in determining scalability. A three-dimensional (3D) architecture, for example, may offer terabits of port capacity. However, its horizontal design results in a bottleneck between 2D cross sections. A router design with a 160 Gbps cross section can only generate a maximum IP pipe of 160 Gbps. This is due to the fact that half of the interfaces (the input pipe) can only talk to the other half (the output pipe) at a maximum of 160 Gbps, irrespective of total fabric or port capacity in the system. In the same manner, an architecture which scales in a star



topology where multiple systems are connected to a central switch can only scale based on the performance of the central box.

#### AN ALTERNATIVE APPROACH

An alternative solution to the challenge of network backbone capacity is based on the observation that as data rates of Internet traffic skyrocket, the bandwidth of individual communication sessions remains relatively small. This means that high-capacity routing can be achieved by using multiple channels in parallel. These channels could be physical fibers, such as multiple OC-48c interfaces, or logical channels, such as DWDM.

Applying multiple interfaces or channels in parallel allows for large IP pipes that utilize the terabits of capacity on a single fiber. A 1.25 Tbps IP pipe can be built by aggregating 125 OC-192c or 600 OC-48c interfaces. The same concept applies for lower-speed interfaces such as OC-12c.

Only last year, an OC-48c link was considered overkill. Today, the data networking industry is in search of scalable solutions that can handle the voice and data traffic for the world. Breaking the router port capacity barrier with a parallel design appears to be the most logi-

cal way to harness the Internet's exponential growth.

Clearly, keeping pace with the exponential growth of "Internet Law" requires new Internet backbone routing approaches that can keep pace with transmission breakthroughs while delivering the reliability, low latency and quality of service capabilities that allow deployment of native IP in carrier backbones on top of SONET/ATM/DWDM infrastructures.

While it is too early to determine which of the various emerging approaches to next-generation IP backbone routing will break today's router capacity barrier, the marketplace is open and receptive to offerings from emerging suppliers. One analyst report notes, "While it may be too early to pick winners, the success of Ciena in DWDM indicates the potential for startups to successfully bring a truly differentiated technology to carriers."

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n this inaugural article of a series in Boardwatch Magazine dealing with the Internet and the Federal securities laws, I will deal with an area that is of particular interest to ISPs: Internet IPOs. It is almost two years since the first Internet IPO by Spring Street Brewing Co. Spring Street relied on Regulation A under the Securities Act of 1933 to create a Web site from which investors could download its offering circular. It raised \$1.6 million from 3,500 investors by selling 844,581 common shares at \$1.85 per share.

#### THE FIRST INTERNET IPO

The story of Spring Street, before its cyberoffering, is rather typical. Spring Street had been in business for about four years before its offering. As a start-up company, it was cashflow negative during its formative years. Money from its founders, their friends and family, which was

used to initially finance the company, was nearly exhausted and more money would be needed to continue the company's growth. This is an inflection point for many successful small businesses. Even when a company has a great idea, a good business plan, knowledgeable management and excellent exe-

> cution, at some point it runs out of easy financing and must attract funds from outside sources to continue to grow.

> onerous corporate covenants and has

the SBA has established an For the most part, these entrepre-Internet site where small neurial, growth companies can succompanies may list their cessfully use additional funding to Reg A offerings for review enhance profitability. The challenge is by accredited investors. finding financing from sources beyond the founder's original circle of friends ACE-Net is a cooperative and family. Banks generally will not effort between SBA and lend on the merits of a business withnine universities, stateout personal or corporate collateral. based entities and other The typical venture capitalist is not non-profit organizations. interested unless the company needs in excess of \$5 million, can live with See http://sba/gov/advo.

> the real potential to become one of a few major players in a multi-billion dollar market segment. Going public in a traditional sense with a firm commitment underwriting is generally not a viable alternative. Companies in this position traditionally have turned to angels. Angels are



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wealthy investors who invest locally in promising companies in lines of business that they understand. Unfortunately, locating an angel reportedly requires something akin to divine intervention, although the U.S. Small Business Administration recently has attempted to formalize the locating of angels by sponsoring a system called ACE-net.

With the Spring Street cyberoffering, another avenue is currently viable: money from public investors over the Internet. These offerings are sometimes also called direct public offerings (DPOs). Unlike traditional public offerings they generally do not involve underwriters or sales agents in the distribution. Even though these offerings solicit funds from the public, they do not require registration under the Securities Act because they rely on Regulation A as an exemption. While Reg A has been around for a long time, it had been virtually dormant until the SEC made extensive revisions in 1992. With the advent of the Internet and its capability to reach millions of public investors, Reg A has become even more useful.

#### **REGULATION A**

Reg A provides an exemption from registration for securities offerings up to \$5 million in any 12-month period under authority of Section 3(b) of the Securities Act of 1933. However, exemption from "registration" does not mean that the issuer does not have obligations under the Federal securities laws.

A Reg A offering must still be "qualified" by the Securities and Exchange Commission, and that still represents a major effort and cost to issuers. The distinction between registration and qualification to a non-lawyer may seem trivial, but it is not. Registration of the offering results in certain legal requirements that are not implicated when the offering is qualified.

For example, an offering under Reg A does not require audited financial statements, while registered offerings require them for either two or three years depending on what other regulations govern the offering. Furthermore, the legal disclosure requirements of a registered offering are much more extensive, and therefore expensive.

Moreover, with a registered offering, the issuer has ongoing disclosure obligations under the Securities Exchange Act of 1934. This Act requires companies to file three quarterly Form 10-Qs and the annual Form 10-K with the Commission, among other things.

Reg A offerings do not have a statutory obligation to provide these disclosure documents under the '34 Act, unless they have more than 500 shareholders and over \$10 million in assets. Because Reg A is somewhere between a hands-off approach and a full blown registered offering, it is sometimes referred to as a "mini public offering."

In addition to permitting the issuance by the company of \$5 million of securities every 12 months, Reg A also allows current shareholders to sell up to \$1.5 million worth of securities

if the company has net income in one of the last two years. The \$5 million ceiling for the company, however, is reduced by the amount sold by the selling shareholders, so that the combined sales by the company and the selling shareholders cannot exceed \$5 million.

Reg A is generally available to most small companies actively operating a business in the U.S. or Canada. However, pursuant to rule 262, Reg A cannot be used by companies with certain "bad boys." These bad boy disqualifications exclude persons from using Reg A who were subject to securities related proceedings, felonies and misdemeanors, or engaged in other fraudulent activities.

#### STATE VS. FEDERAL LAWS

Issuers should be aware, however, that Federal and state authorities have concurrent jurisdiction over securities offerings. While Reg A exempts the offering from registration under the Federal securities laws and regulations, it is not an exemption from state registration. Therefore, notwithstanding the availability of an exemption under the Federal rules, the offering must qualify for a separate exemption in each state where the company offers its securities, or it must register in those states in which no exemption is available.

State Acts are largely based upon the Uniform Securities Act of 1956 which thirty-nine states have adopted, though some with significant changes.

#### PROCEDURES UNDER REG A

Procedurally, when relying on Reg A, an offering statement (as opposed to a registration statement) must be filed with the SEC in Washington. The offering statement is prepared on Form 1-A and has three parts: Part I - Notification, Part II - Offering Circular and Part III - Exhibits.

#### THE OFFERING CIRCULAR

The offering circular is like the more familiar prospectus, which is used in registered offerings. The company has a choice of three formats in preparing the offering circular in Part II. One of the models (Model A) is a question and answer format, which is similar to Form U-7 (or SCOR form) developed by state securities administrators and NASAA. ACE-Net accepts only Model A disclosure for posting on its system, because it permits sorting by computer.

The offering circular in Form 1-A requires disclosure of risk factors; business and properties; offering price factors; use of proceeds; capitalization; description of securities; plan of distribution; dividends, distributions and redemptions; officers and key personnel; directors; principal stockholders; management relationships, transactions, and remuneration; litigation; and federal tax matters. The financial statements that must be included in the offering circular need not be audited, but

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must be prepared in accordance to generally accepted accounting principles (GAAP).

#### THE OFFERING STATEMENT

Once the offering statement is filed with the Commission, the company can begin to offer the securities described therein, but can not sell them until the offering statement is qualified. The offering circular, which at this point is a "preliminary offering circular" under rule 255 is the only document that can used to market the offering.

The Commission reviews the offering statement for compliance with the Federal securities laws and generally issues comments to the company suggesting changes that should be made. The company amends the offering statement in response to the Commission's comments and thereafter files an amended offering statement. The process of filing, review, comment and amendment continues, sometimes three or four times, until the Commission is satisfied with the disclosure in the offering statement.

#### **QUALIFICATION**

Once the Commission is satisfied, the issuer is permitted to request qualification. Qualification is important because once the offering statement is qualified, the company can accept investors' subscription agreements and their money. Since investors usually only have a preliminary offering circular until the Commission qualifies the offering, the final offering circular, which incorporates all the amendments made by the company in response to the SEC's comments, must be delivered to each investor at least forty-eight hours before the confirmation of sale.

#### ONGOING REPORTING AND DISCLOSURE

Pursuant to rule 257 the issuer and any selling shareholders must file Form 2-A reporting the sales of securities and the use of the proceeds every six months after qualification or until all the proceeds have been applied. A final Form 2-A is required to be filed within 30 days after the final sale of securities or final application of the proceeds, whichever is later.

#### FEDERAL SECURITIES LAWS AND THE INTERNET

Reg A neither explicitly allows nor disallows the use of the Internet in conjunction with an offering. This is not surprising, given that Reg A was written well before the Internet gained widespread acceptance. The Commission, however, has dealt with electronic delivery for purposes of the Federal securities acts in two seminal interpretive releases in October 1995 and May 1996.

The October 1995 release, "Use of Electronic Media for Delivery Purposes," which is the more important for purposes of Reg A, states that "the Commission believes that, given the numerous benefits of electronic distribution of information

and the fact that in many respects it may be more useful to investors than paper, its use should not be disfavored."

This release confirms that issuer and third party information that can be delivered in paper form under the Federal securities laws may also be delivered in electronic format. The Commission, however, recognized some differences between paper and electronic communications, and identified three factors that should be considered when using electronic delivery of mandated documents. These three factors are notice of delivery, access to the electronic documents and evidence of delivery. These factors must be kept in mind to ensure that electronic delivery will be comparable to paper production. The underlying principle is that electronic delivery should not make access, possession and retention of the documents more burdensome for the investors.

#### THE SPRING STREET BREWING CO.

Spring Street distributed the offering exclusively over the Internet by using a Web site that provided for downloading of its offering circular. Only persons who had notice and access of the Web site were solicited. Maintaining records that identify those who visited and downloaded the offering circular provides the evidence of delivery.

Once a company has its offering statement qualified, it can email its final offering circular to those investors who have executed subscription agreements online. Arrangements are then made to receive the money from, and deliver the securities to, investors. The offering ends once all the securities qualified under the offering statement are sold or the offering is terminated by other means.

After the completion of its offering, Spring Street discovered a distinction exists between offering its securities in the first place and the development of a trading market thereafter. A mechanism that provides liquidity is an important feature for investors and encourages their willingness to initially invest in the company. The next article will deal with Spring Street's efforts to create an Internet trading market for its own securities, and the problems it encountered. In the end it resolved its problems, and the SEC has since established rules that allow Internet-based bulletin boards that facilitate the buying and selling of securities by a company's shareholders. •

Tony Stanco is a senior attorney at the Securities and Exchange Commission in the Division of Corporation Finance in Washington, D.C., and is a member of the New York Bar. He received a Master of Laws in securities regulation from Georgetown University Law Center. He can be reached at stancoa@hotmail.com.



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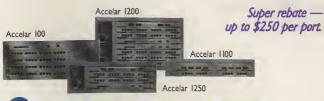
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Model	SPECint_rate_base95
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Sun Ultra 2 Creator (3D) Model 2200	133
Digital AlphaStation 500/500	113

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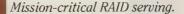
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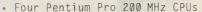
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and founder of

TUCOWS, The

Ultimate Collection

Flint, Michigan with

his wife, Vicky and

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army at the tender age of 17, Scott

his degree in Computer Information

Systems from Mott

received an Honor-

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able Discharge

after eight years

service. Scott wel-

comes input from Internet users and

software develop-

ers at tucows @tucows.com.

received

of Winsock Soft-

ware. He lives in

two daughters.

## **TUCOWS**

Scott Swedorski

#### EASY TO USE ANIMATION TOOLS

One of the more memorable TV commercials recently is the IBM commercial with the two guys gushing about their flaming logo. Just when they convince themselves that they've accomplished something really

cool, a co-worker comes along and takes the steam out of them by asking whether or not people could actually buy their products on the site.

As funny as the commercial is, there is something compelling about adding motion and special effects to your web pages, and some animation can be productive as teaching tools and navigational aides. Luckily, there are a huge variety of animation tools available on TUCOWS, and some of these applications have extra features that make them handy as general image manipulation tools as well.

**AniMagic** Version Number: Revision Date: June 14, 1998 animg105.zip File Name: Byte Size: 525,498 Shareware, 30 day evaluation License: Cost: Home Page: http://rtlsoft.com/animagic/ Also Available: Windows 3.x Version Also Available: Windows NT Version

An easy to use yet very full featured animated GIF creator, **AniMagic** has easy color optimization, reduce number of colors, and a transparent color picker. It also includes special effects like fade in and out, wipe and more.



GIF Construction Set is an easy to use application for creating interlaced, transparent GIF files, multiple image GIF files and animated images. Features include drag and drop support, animated LED signs, two-dimensional rotations, special effects text titles, transitions, and more. You can flip, rotate, scale and crop all or part of an animated GIF file, and add, edit and delete comment blocks.



An easy to use, relatively compact, but thorough GIF animator program. It includes the ability to optimize palettes as well as shrink the file size through various other methods. Other useful features include animation resizing, support for Photoshop PSD, JPEG, AVI, BMP, and GIF files, export to AVI, and HTML publishing assistance.



Animato by Lake Clear Software is a GIF animation painter and assembler. Create GIF files for your web pages, or create sprites for video games. A full range of paint tools is included, as well as animation tools to create optimized GIF files. Some advanced features include: paint animation frames while you watch the entire animation run, paint on all frames at the same time, drag and drop frames within an animation or between different animations. You can view and edit many animations at the same time, even if they have different color palettes.

A Smaller Gif is a program that greatly compresses animated GIF files without any loss in image quality. In our testing we found it worked very well, with compression such as 270k instead of the starting 400k for our big test graphic. The unregistered ver-



sion doesn't allow saving your compressed animated GIF, but is still worth checking out.



An excellent GIF animator, arguably the best in the industry. It supports over 30 formats, includes an incredible optimization routine. Animation and Optimization Wizards streamline the entire animation process. Over 200 levels of "Undo", transition and filter effects make Gif Animator an industry leader.

#### **MAC PICKS**



Animation Maker is a great little program for making animated GIFs for your web page. It's easy to learn yet full featured enough to get professional looking animations on your web page quickly.

GIFmation offers an expansive feature set that is tuned specifically to the needs of GIF animation creation in an



interface that is intuitive and easy to use without sacrificing capability or control. GIFmation can provide browser compatibility checking and warn you when your animation settings won't work correctly in certain browsers, and onion skinning, coordinate image positioning, and automatic image alignment options mean you never have to struggle with frame alignments.



A Smaller GIF is a computer program for shrinking animated GIFs without changing their appearance. A Smaller GIF can reduce the amount of space an animation uses without introducing any visual artefacts, distortion, or blurring. GIFs are stored using a loss-less compression format. A Smaller GIF tries several different compression techniques, and uses the technique that will minimize the size of the resulting GIF.



**WebPainter** helps you make animated GIFs for your web pages. It also supports JPG and PNG graphic file formats. For more sophisticated animation artists, WebPainter SE offers animation tools such as Onion Skinning foreground/background layering and cel stripping.

If you want to see some nifty animations one of the TUCOWS' crew made with these programs, visit Brandi Jasmine's Animation Station at (www.twostar.com/gallery/animation/). Check out the individual web sites for the applications as well, many of them also have samples online.

One area where these companies fall short is in teaching animation technique. It can be hard to find even basic instruction on the Web, and the good books on the topic are often expensive (check the local library before you plunk down \$30 for a basic tutorial). You might try downloading other GIF animations and "deconstructing" them in your animation program. This will give you an idea how the effects are created. Remember though, you can't use other people's GIFs in your own creations without permission.

# ISP MATING RITUALS by Bill McCarthy

#### TWO STRATEGIES FOR DEALING WITH COMMUNICATIONS CONVERGENCE

ur field studies of ISP mating rituals have identified several strategic tendencies among the ISP population, when companies prepare for communications convergence. These strategies seem to be applicable to both ISPs or ISP wanna-bees as this month's case studies reveal.

In the first case we look at an old ISP or BBS that has picked up the IP religion while retaining some of its old fashioned charm. In the second case we have an old telco looking to restore its glory days, but struggling to find the focus it once had. And in our third case we have a giant willing to sacrifice all for love.

PRODIGY IS NO OLD MAID

"I want to dance with the prettiest girl at the dance; I don't want to dance with the first pretty girl who comes along," said Prodigy Internet CEO Russ Pillar, making it clear that Prodigy is just not ready to partner with a telco. Pillar says the company wants to continue to grow and put itself in the position of choosing the right partner rather than hooking up with a telco now.

Prodigy has been around the dance floor a few times. But it is the convergence of communications that provides the allure, the drive to mate, and it seems like it is only a matter of time. . . "We are moving toward a world of bundled services," said Pillar.

Yes, Prodigy is the same company that pushed our 386s into an unknown world of graphical interfaces beyond the hometown BBSes as early as 1988. Prodigy tried to make the online world an easy journey, what we now call transparent to the user, and it courted the dial-up user. With content and simplicity, the company seemed to be the dominant player in the pre-Internet world. Yet somehow Prodigy missed something that America Online did not.

Prodigy was the first online service with a graphical interface in 1988, going national in 1990. Owned by Sears and IBM, the company was not as committed to the online world or as aggressive as it should have been.

Jim L'Heureux, senior vice president of marketing, said in 1995 the company sold to an investors group committed to the Internet and went through major changes to become fully Internet compliant. In 1996, the name changed to Prodigy Internet, and the company integrated more Internet technologies. With 470,000 subscribers now, the company is claiming to be the fastest growing ISP based on subscriber numbers. Perhaps it is. L'Heureux said the company is trying to be very out-sourced, entering into an agreement with Split Rock for use of its all-digital, all-ATM network, and it received a 98.7 connectivity rate from Inverse Technology, and 86.88 percent on our Boardwatch dial-up tests done in June.

Like everybody else, the company wants to be known as fast and dependable, but it also wants to attract the get-on, get-what-you-need, get-off customers who do not see the Net as a lifestyle or cultural event. The company has 600 56 Kbps dial-up POPs, wants to be sure of excellent customer service and present new services that its customers want through third party partnerships. It does some Web hosting, but that is not a focus at the moment. Instead it tracks use to tailor its service to specific customer needs.

"We assume users are not technically adept and that they may not want to be, but that they want to go beyond the content and the hand-holding of AOL," L'Heureux said. Paybacks could be hell for AOL. In those days when AOL and MSN stalked Prodigy's customers, IBM and Sears were as unaware as a deer in the headlights. Networking was not their core business, while AOL was very aggressive and MSN was, well. . . Microsoft. "We have learned, in the space, that what you have to be is focused and aggressive," said L'Heureux. And Pillar set the focus since joining Prodigy Internet in October 1997, when he decided to position the company's Internet service as a utilitarian "Tool for Living," and set out to prove you can make a living at \$19.95.

#### **CLUELESS IN NEW JERSEY?**

While Prodigy Internet hones its focus, AT&T struggles to be everything to everyone. Contrary to rumor, AT&T is not buying Telecommunications Inc., to finally put an end to the question of whom people hate more: their cable television service provider or the phone company. Although convergence across the industry may someday make that a moot question, AT&T seems to be trying to prove that money can't buy you love.

With the Baby Bells allegedly creating roadblocks for competition (where have ISPs heard that before) deals with TCI and TCG give AT&T a way to circumvent its last mile Baby Bell piranha mote. But did AT&T give up too much for it?

Bill McCarthy, a recovering newspaper reporter, is an editor with Boardwatch Magazine. He is surrounded by piles of press releases on a variety of Internet-related subjects. This column is one way to diminish one of those piles as well as an attempt to keep track of the mergers, acquisitions and some of the partnerships occurring among Internet service providers and their vendors. He can be reached at bill.mcca rthy@board

watch.com.

TCI CEO John C. Malone walked away with \$4 billion in personal assets, while AT&T paid \$3,000 a subscriber for an all-stock transaction valued at \$48 billion. It's TCI's annual losses of \$500 million, however, that really frightens some investors. But wait, there's more in the search for ubiquity.

AT&T and BT announced July 27 that they will create a \$10 billion global venture to serve multinational companies and individuals and businesses around the world. The venture will combine the "trans-border assets and operations of each company," including their international networks, international traffic, international products for business customers and AT&T and BT's multinational accounts in some industries. That includes Concert services (MCI replacement?). The two companies plan to develop an Internet Protocol (IP)-based global network, as well. In a related but separate development, AT&T and BT have agreed to invest a total of \$1 billion in U.S. businesses involved in high technology and emerging communications markets.

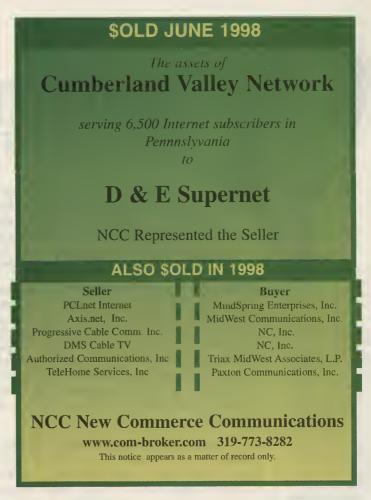
Owned equally by AT&T and BT, the venture in its first full year of operation is expected to have revenues of more than \$10 billion, growing thereafter in excess of 15 percent a year. Operating profits are expected to be around \$1 billion in the venture's first full year, growing at 15 percent to 20 percent a year. Capital expenditures are expected to be around \$1 billion.

AT&T could use that Concert income. The company said July 23 that it completed its merger with Teleport Communications Group (TCG). Based on AT&T's recent stock price, the all-stock transaction is valued at \$11 billion. AT&T immediately incorporated all TCG's current services into its products for businesses nationwide. The company hopes to circumvent the Baby Bells that it cut loose in the seventies and jump into the \$21 billion business local service market. The company plans to roll out products in 34 more markets this year; and by early next year, AT&T plans to integrate local service into its business offers in 66 of TCG's markets.

The merger combines AT&T's Internet Protocol (IP) business with CERFnet, TCG's Internet unit, making AT&T one of the largest Internet service providers for businesses and a major backbone provider for smaller ISPs. With the close of the merger, AT&T will begin to integrate its network with CERFnet's. By the first quarter of next year, the backbone of the combined network will be upgraded from OC-3 (155 Mbps) to OC-12 (622 Mbps). The upgrades should quadruple AT&T's traffic-handling abilities. The two companies are very large players in Web hosting, as well.

We tried to talk to AT&T, thinking that its strategy and that of Prodigy would make a good contrast of situations for ISPs to watch. We were told that *Boardwatch Magazine* is just not big enough to warrant the time of any of the higher-up executives, and the lower-up executives could not address the companies overall strategy for communications and the future of IP.

We tried to explain that the company was missing an opportunity to address a significant market for goods and services, if not in terms of numbers but in terms of people who actually make decisions about purchasing equipment, Internet access and other communications services, not to mention potential revenue-enhancing partners. We're still waiting to hear back, and we're left wondering if AT&T is still hoping money can buy love.



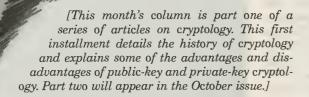
#### SOME YOU'LL NEVER WOO

So MCI/UUNET wins the *Boardwatch*/Keynote Backbone performance test at the same time it sells the top-secret backbone that they've kept hidden under a Darth Vader mask. (See http://boardwatch.internet.com/isp/bb/mci.html). Meanwhile, those who would prevent the merger used numbers of ISP connections to backbones from *Boardwatch*'s ISP count to show that a UUNET-MCI combo would unfairly dominate the Internet backbone market.

Maybe it's just not in the stars for *Boardwatch Magazine* and MCI to ever be friends, while Cable & Wireless seems to keep popping up on top. They bought portion of the network from MCI that tied for the top of this round of Keynote testing. Speaking of stars, could this be the self-inflicted poison that leads to the demise of our star-crossed lovers Juliet MCI and Romeo WorldCom? Is fair Juliet feigning the death of its Internet stronghold and will our despondent Romeo destroy himself? Stay tuned. ◆

## **@INTERNET** by Thom Stark

SECRETS AND LIES (PART I)



In California, where I live, it takes the signatures of just less than 700,000 voters to get an amendment to our state constitution on the ballot and a simple majority vote will get it adopted. Oddly enough, this process of amendment by initiative has saddled us with a constitutional requirement that practically all local tax increases be approved by a two-thirds votewhat's known as a "super majority" - via a series of amendments that were themselves voted in by a simple majority.

That's a little too undemocratic for me, so I'm trying to gather support for another amendment called "The Fairer Voting Act" (www.starkrealities.com/fairervotingact.html) that would reduce the super majority vote to three-fifths of votes cast. (It reduces the super majority instead of abolishing it, because I'm afraid the California Supreme Court would rule that eliminating the super majority was a "reform", rather than an amendment and throw it out. California constitutional law can be extremely complex - and often counter-intuitive.)

In doing the research that led me to write The Fairer Voting Act, I've spent a lot of time studying the California Constitution. I disapprove of many provisions of that document, but I'm extremely glad that the framers had the good sense to explicitly spell out the right to privacy in Article I.

Most Americans mistakenly believe that the U.S. Constitution includes a specific guarantee of the right of personal privacy. It doesn't. Although the Supreme Court has ruled that a combination of the Fourth Amendment, (which safeguards against "unreasonable searches and seizures",) the Fifth Amendment (which protects individuals from being forced to testify against themselves in criminal cases) and the Ninth Amendment (which states that "The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people,) creates an *implied* right to privacy, it isn't formally established anywhere in the Constitution.

That's why police and intelligence agencies can tap telephones, open mail and generally spy on people. It's also why paparazzi can hire helicopters to buzz celebrity weddings and why tabloid TV shows and "legitimate" TV newsmagazines alike can get away with using hidden cameras and ambush interviews. It's also a big part of the reason digital encryption has become such a hot issue.

#### HISTORY IS MADE AT NIGHT

Cryptography - which combines the Greek words KRYPTOS and GRAPHOS and literally means "secret writing" - has played a part in human commerce for thousands of years. Three thousand five hundred years ago, Mesopotamian scribes used basic ciphers to guard their secret pottery glaze formulas. Not surprisingly, the military has used encryption since history began. In his battlefield messages to the Roman Senate, for instance, Julius Caesar regularly used simple letter substitution codes and other basic cryptographic techniques. Like their military counterparts, diplomats and spies have also always used "secret writing". In the 1790's, during the time he served as George Washington's Secretary of State, Thomas Jefferson invented a wheel cipher machine (www.monticello.org/Matters/interests/whe el\_cipher.html) and used it to encrypt his correspondence with the American ambassador to France whose postal inspectors regularly steamed open foreigners' mail. One hundred and fifty years later, during WWII, the U.S. Navy developed the M-138-A, which was basically a variation on Jefferson's device.

In 1926, the German Navy began purchasing an electro-mechanical encryption device manufactured by one Arthur Scherbius. This famous machine, based on a 1919 patent by Dutch inventor Hugo Alexander Koch, was known as Enigma. It used a set of three rotors to apply a progressive letter-substitution code algorithm. The German Navy modified Scherbius' Enigma by adding a plugboard, which greatly increased the number of possible letter substitutions - and thus the strength of its ciphers. Enigma was used to encrypt and decrypt virtually all German military communications throughout WWII. The Allied effort to break both Enigma and Purple - its Japanese counterpart sparked the era of computer-assisted cryptanalysis. At England's Bletchley Park, Alan Turing and his colleagues used an increasingly - sophisticated set of electro-mechanical computers they called "bombes" to test solutions to Enigma, while their counterparts at the American Office of Special Intelligence began developing purely electronic decryption engines to assist in cracking the 4-, 5- and 6-rotor Enigmas which came into use later in the war.

Then, in 1947, the U.S. Army's Signal Intelligence Service's VENONA project (www.nsa.gov:8080/

Thom Stark is president of STARK REALITIES, a consulting firm based in the San Francisco Bay Area, which specializes in integrating Internetnative technologies into existing business networks. He also conducts seminars and tutorials about the Internet at trade shows and for business and user groups. He is the author of the serialized online science fiction novel, A Season in Methven. (www.starkreal ities.com/Me thven/). Mr. Stark maintains a noncommercial Web site that focuses on IP internetworking technology and policy issues at www.starkre alities.com and his e-mail address is thom@starkreal ities.com.

docs/venona/venona.html), the forerunner of the National Security Agency (NSA), decrypted messages which proved that traitors working on the Manhattan Project had passed the secret of the atomic bomb to the Soviet Union. Based in part on VENONA's revelations, the United States Senate then approved the Export Control Act of 1949, allowing the State Department to classify all but the very weakest cryptographic technology and products as munitions subject to stringent export restrictions - a policy which continues in force to this day.

The U.S. is far from alone in regulating cryptographic exports. While Russia has gone from an absolute ban on the domestic use and export of crypto under the former Soviet Union to a seeming lack of any controls today, France and Australia both ban the export and use of products which make use of encryption strengths greater than 40 bits - a key strength that a moderately powerful microcomputer can easily defeat. Britain's Official Secrets Act forbids even revealing the strength of encryption which Britons may export. Meanwhile, China - while it has no published laws on the subject - exacts the death penalty for the export of either cryptographic technology or products.

#### STOP MAKING SENSE

In 1975, under contract with the U.S. government, IBM developed an encryption technology which came to be known as the Data Encryption Standard (DES). DES was only adopted as Federal Information Processing Standard (FIPS) PUB-46 after its key length was reduced from the original 128 bits to 56 bits at the NSA's insistence. Despite 20 years of progress in digital cryptography, DES - which is a symmetric encryption scheme - has remained the U.S. standard ever since.

The problem with symmetric-key encryption is that every key holder has a copy of the same encryption key. Although shared-secret schemes permit faster decryption, the fact that all copies of the shared key are identical means that, if any one copy is compromised, all the other copies are automatically also compromised. And - since all parties to the secret share the same key - no digital signature to an encrypted transmission is possible. That means a message's author can't be definitively established, since any of the common keyholders could have encrypted the message. Likewise, a keyholder can't definitively repudiate authorship of any message encrypted with a shared key. And *that* means a third party could forge what appears to be an authentic message from one of the authorized keyholders, especially if none of those "official" keyholders knows their shared key has been compromised.

Those problems-and especially the problems of digital signing, authentication and repudiation, required a completely different approach - one that took five years to appear.

In April 1980, Martin Hellman, Whitfield Diffie, and Ralph Merkle were issued U.S. Patent 4,200,770 and in August 1980, Hellman and Merkle were issued Patent 4,218,582. Those patents - both of which expired, and thus entered the public domain in 1997 - form the basis of asymmetric or (as it is better-known) public-key digital cryptography, although Patent 4,405,829, issued in 1983 to Ronald Rivest, Adi Shamir, and Leonard Adleman, outlines the more widely-known RSA public-key algorithm, which -like the Diffie-Hellman model - is based on the difficulty of factoring large prime numbers.

In the public-key model, every user has two keys. The first is a private key, which is never revealed. The second is a public key, which is made freely available to anyone with whom the keyholder wishes to exchange encrypted messages. Data which is encrypted using only the private key cannot be decrypted by outsiders, unless the encryption is broken or the private key is revealed. Data destined for other parties is encrypted using both the author's private key and the recipients' public keys. Those parties whose public keys were used to encrypt the data can then use their respective private keys to decrypt it and use the author's public key to establish its authenticity.

While public-key encryption and decryption is slower than symmetric-key encryption, (because more than one key is used,) it has capabilities which make it a superior choice for use in online commerce. Public-key cryptography offers advantages such as digital signatures, (where the author's private key is used to produce a unique signature block based on a checksum of the document's original contents,) authentication (since no one else has access to an author's private key, no one else could have authored a document which he/she has encrypted) and the ability to repudiate forged documents (because a public key cannot be used to forge a digital signature). Public-key users can also "countersign" each other's public keys, thereby vouching for each other.

Today, public-key technology is usually used for authentication, signing and repudiation, as well as to encrypt the keys of symmetric encryption algorithms (such as IDEA, DES, RC4 or MD5) that are used for bulk data encryption. That dual approach allows the safety and authentication capabilities of public-key encryption for the key-exchange process to be combined with the speed of symmetric-key algorithms for encrypting and decrypting the data in message bodies. ◆





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Stapleton is also editor of I\$P Report,

# ISP\$ MARKET REPORT

#### THE DANGERS OF TRADING WITHIN YOUR PEER GROUP -A LOOK A THE DIAL-UP SIDE OF THE BUSINESS

There are three bell-weather stocks on the consumer ISP dial-up side of the business: America Online (NYSE: AOL), EarthLink Networks (NASDAQ: ELNK) and MindSpring Enterprises (NASDAQ: MSPG).

These three companies constitute what Wall Street likes to call a "peer group" for purposes of analysis. Looking at peer groups financial operating statements is a useful way to see where particular companies might improve.

America Online's size clearly puts it in a league of its own, but it pays to look at all three side-byside to see what EarthLink and MindSpring might become if run properly.

One can postulate. How come MindSpring has earnings and EarthLink does not? Oh, EarthLink is spending more in percentage terms and absolute dollars on marketing. Is that a good strategy? Well they have more subscribers than MindSpring. Is that a worthwhile trade-off?

EarthLink and MindSpring have been performing famously. Both have shown steady quarter-by-quarter revenue and subscriber growth, while continuing to improve gross and operating margin. The chart below highlights the margins posted in 2Q98 and the annual growth in revenue and subscribers since 2Q97.

And so the analysis goes on.

	EarthLink	MindSpring
LTM Revenue Growth	99%	84%
LTM Subscriber Growth	108%	114%
Gross Margin	50%	70%
Operating Margin	(12%)	8%
Avg. Monthly Churn	3.3%	NA

The problem is peer group analysis is a much less effective tool for determining if a stock is undervalued. The stock may not be undervalued, the whole peer group may be overvalued.

The EarthLink Operating Margin result is before adjustments for one-time expenses associated with the Sprint transaction.

Nevertheless, nowadays that has not stopped Wall Street analysts from writing research reports that say, "Relative to its peer group, XYZ Internet company is under-valued". They tend to leave out comments about the peer group's trading value versus its intrinsic value.

Both have also been diversifying beyond Internet access and growing their non-access revenue streams. EarthLink now has 9,500 Web hosting accounts. MindSpring has 15,000. EarthLink booked \$1 million in incremental non-access revenue (read transactions and advertising). MindSpring posted \$3.1 million in business services.

This is fancy tap dancing.

EarthLink and MindSpring have also pursued similar financing strategies of late. Both recently completed secondary stock offerings to put cash in the coffers and split their stocks for greater liquidity. (You would have thought this would have taken some of the edge off stock demand, but it has not.)

Meanwhile, Investors are having a near manic love feast with the consumer dial-up ISP business, and other Internet based, peer groups. Below are a few metrics to show just how high the enthusiasm, and valuation multiples, have gotten.

EarthLink and MindSpring are travelling on the well-worn path of AOL. And they will probably succeed. There is room for at least a half-dozen 1 million subscriber ISPs. Both have done a great job positioning themselves as AOL alternatives in the media whenever AOL raises prices or has a network outage.

	AUL	EarthLink	windspring	
Subscribers	13,800,000	710,000	393,000	
Stock Price	\$118.00	\$42.38	\$48.50	
Fully Diluted Shares	245.5 million	46.5 million	28.3 million	
Recent Quarterly EPS	\$0.32	\$(1.06)	\$0.24	
Market Capitalization	\$30.8 billion	\$1.97 billion	\$1.37 billion	
Price per Subscriber	\$2,611	\$2,776	\$3,495	
Market Cap./Revenue	11 1x	13.1x	13.7x	

These dial-up businesses are trading at between 11.1 and 13.7 times revenue, and between \$2,600 and \$3,500 per subscriber. America Online's metrics are actually the laggards.

But they are not yet AOL by any operational measure.

Applying some "peer group analysis," I might say, "Umm, everything looks in-line. AOL may be a little under-valued relative to EarthLink and Mindspring. Perhaps I'll buy some AOL."

Valuation metrics is another story.

This is a bad road to get on.

100

Lets step outside our own little private ISP Idaho and look at the big wide world. There is more to analyze than peer group comparables. I suggest a quick review of the following:

Discounted Cash Flow Analysis — This can be looked at a number of ways, but to make a 20 percent return on investment from a subscriber I bought for \$2,775, I would need to see that subscriber generate cash flow of \$555 per year in perpetuity. You can assign your own likelihood of this happening.

Earlier Valuations — Six months ago these three businesses traded at 3.0x revenue and \$555 per subscriber. In theory, at that time, the growth potential of the stock was already included in the valuation.

The Value of Similar Industries — The cable industry had two landmark deals this year; AT&T buying TCI and Paul Allen buying Marcus cable. In both cases, the subscriber base was valued between \$2,300 to \$2,500 per subscriber. These were all time high valuations for cable. And cable, recent competitive inroads notwithstanding, is still a geographic monopoly and a license to print cash flow. The ISP business has not proven that yet.

The Value of Other ISPs — Business ISPs, such as PSINet and Verio, trade between 7.0 to 9.0. Some argue they have more dependable revenue streams.

EarthLink and MindSpring are not AOL — Even if AOL is worth its price. Are two companies 1/20th its size, potential notwithstanding, worthy of the same metrics as the company that alone constitutes half the industry?

Alternative Technologies have not gone away — Although ever slow to produce, there is still a risk from alternative technologies such as cable modems, DSL, satellite and whatever else comes along. Was it not a new technology in 1995 that spawned EarthLink and MindSpring?

Of course if you think the above is hogwash, check out the IPO filing on Internet America (NASDAQ: GEEK). Internet America is a dial-up ISP out of Texas. With approximately \$11.7 million in annualized sales, it's going public with a market capitalization of \$77.3 million (after full dilution). That's only 7.0x revenue, a total steal compared to its peer group. ◆

### **ISP\$** Report Market Index

Symbol	Exchange	Company	Price 5/22/98	Price 6/22/98	Price 7/22/98	Percent Change	Shares (Millions)	Market Capitalization (Millions)
ATHM	NSAD	AtHome	37.63	37.13	48.00	29.28%	118.75	\$57,800.00
AOL	NYSE	America Online, Inc.	84.63	101.13	130.81	29.35%	216.20	\$28,281.12
CNCX	NASD	Concentric Network Corp.	22.50	24.75	34.75	40.40%	14.18	\$492.76
ELNK	NASD	EarthLink Network, Inc.	27.06	36.00	44.06	22.39%	27.49	\$1,211.21
IDTC	NASD	IDT Corporation	31.00	25.63	27.75	8.27%	22.87	\$634.64
мсом	отс	Metricom Inc.	10.38	8.75	9.38	7.20%	18.51	\$173.62
MSPG	NASD	Mindspring Enterprises, Inc.	19.52	24.46	46.77	91.21%	25.78	\$1,205.73
OZEMY	NASD	OzEmail Ltd.	22.25	19.63	21.38	8.91%	11.54	246.73
PSIX	NASD	PSINet, Inc.	11.38	12.31	15.94	29.49%	51.07	\$814.06
RMII	NASD	Rocky Mountain Internet, Inc.	8.75	8.94	17.13	91.61%	7.31	\$125.22
WCOM	NASD	WorldCom Inc.	45.25	47.56	54.31	14.19%	1,032.09	\$56,052.81

On July 1, EarthLink announced a two-for-one stock split. The May and June prices reflect the stock price after the split.

On June 24, MindSpring announced a three-for-one stock split. The May and June prices reflect the stock price after the split.



## LEGAL DEVELOPMENTS

by Robert Cannon

#### SCHOOLS AND LIBRARIES WIRING TANGLED IN POLITICS

If you are reading this article, you might be one of the few.

The Universal Service Schools and Libraries program has spiraled down to such a political football and bureaucratic nightmare that many Internet providers have given up on the program. To ensure that Internet providers never quite feel comfortable with the program, the Federal Communications Commission (FCC) has once again made significant revisions to the program.

The Schools and Libraries Program is a universal Internet access program set up by the FCC, pursuant to the Telecommunications Act of 1996. Schools and Libraries can use funds from the program to acquire telecommunications services and Internet access, including subsidies for the installation of connections all the way to the classroom. The program subsidizes these services by paying a discount directly to the service providers on behalf of the participants. The level of the discount, which ranges between 20 and 90 percent, is determined by the number of school children who are eligible to participate in the National School Lunch Program and whether the school is in an urban or rural environment.

On June 22, the FCC released its *Fifth* Order on Reconsideration of the Schools and Libraries Program. This Order makes the following changes to the program: (1) the amount of funding is drastically reduced, almost by half; (2) the funding year is altered from a calendar year to a fiscal year cycle (July 1 - June 30); and (3) a system of priorities has been implemented to ensure that the most disadvantaged schools take first from the program.

In addition, in response to Congressional criticism, the FCC has significantly restructured the School and Libraries Corporation (SLC) which administers the program.

The controversy surrounding the Schools and Libraries Program reached a climax in the month of June with Speaker of the House Newt Gingrich promising to do away with the program within two weeks. He did not succeed. However, supporters of the program were sent scurrying in an attempt to find ways to salvage the "Gore Tax," as it is coming to be known in the policy battle.

Responding to the winds of politics, the FCC finally concluded that it should significantly scale down the program. The FCC ordered that the Universal Service

Administrative Company, the entity charged with collecting the funding for the universal service program, to collect "no more than \$325 million per quarter for the third and fourth quarters of 1998 and the first and second quarters of 1999 to support schools and libraries." This means that only \$1.275 billion will be collected in the first year of the program, 43 percent less than the \$2.25 billion cap originally set by the FCC for the program.

This drastic reduction in funding creates a bit of a problem. Approximately 30,000 applications have been received from schools and libraries, requesting approximately \$2.02 billion in discounts. Clearly not all that applied will get. In order to decide who will get and who will not, the FCC has devised a new priority system.

The new priority system applies only to those applications received during the 75-day application window. Originally, the FCC created a 75-day application window, starting the first day that the SLC received applications for the funding year. Any applications received within that window would have been treated as if filed simultaneously. Applications received after the close of the window will be considered under the old first-come, first-serve system — if there is money left.

The priority system segregates the funding between those requests for subsidies for telecommunications services and Internet access, and those for subsidies for internal connections (approximately \$1.3 billion was requested to subsidize internal connections). Requests for telecommunications services and Internet access take first from the fund. The FCC made the assumption that there will be enough in the pot to cover these requests and thus did not break this category down further. Any funds remaining will go to support internal connections, with requests from the most disadvantaged applicants being filed first. Thus, schools eligible for a 90 percent subsidy will take first. Schools in the 80 percent category will take next. And so on until the pot is exhausted.

A problem with this system is that expenditures on Internet access tend to presume expenditures on internal connections. If participants cannot build the networks, then money to connect the networks is useless. Another problem is that if you receive subsidies from schools and libraries in the last discount category to take in a given year, there is a significant risk that there will not be enough funds in the next year, as the program grows, to subsidize your contracts.

The final significant revision to the program involves the FCC buying a significant clue. The SLC funding

Robert Cannon is the founder of the Internet Telecommunications Project. He is a contributing editor to the Law Journal Extra's Internet Advertising and Marketing Web site. His articles have appeared in the Federal Communications Law Journal, the Federal Communications Bar Association Newsletter, the Commercial Internet eXchange Newsletter, ISP Report, and OnTheInternet (the magazine of the Internet Society). Cannon recently spoke at Computers Freedom and Privacy 1998. Cannon is also cochair of the Online Telecommunications Committee of the Federal Communications Bar Association, was the FCBA's Web master from 1995 to 1997, and is the owner of the listsery CYBERT-ELECOM-L. He is a graduate of the American University

Law School, has a

master's degree from Yale University,

and a bachelor's

Oberlin College.

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cycle was originally based on the calendar year with the requirement that participants renew their applications annually. The problem is that the funding cycle of schools and libraries is generally on a fiscal year. The two did not match. Thus schools and libraries were struggling to create meaningful budgets and technology plans without knowing whether or how much funding they would be receiving from the SLC. Therefore, the FCC switched the funding cycle to a fiscal year of July 1 through June 30. In order to make this work, the first funding cycle, which would have ended December 31, 1998, will be extended to 18 months and will end June 30, 1999. This means that schools, libraries, and Internet companies that were not able to participate in the first funding year will have to wait an additional six months before being able to attempt to participate in the next year.



Finally, the FCC has substantially restructured the SLC. Certain members of Congress had attacked the SLC as an illegally created corporation with excessive bureaucracy and an overpaid staff. Congress had proposed legislation to reform the SLC, but the specific language calling for this was struck from the final version of the bill it attached to. Nevertheless, based on this nonexistent legislative language, the FCC concluded that there was clear congressional intent, and acted.

The SLC, which was created along with the Universal Service Administration Company and the Rural Health Care Corporation to implement universal service, will be consolidated together with the USAC and the RHCC to form one corporation. The FCC has requested specific legislation from Congress confirming that the FCC has authority to create this corporation. In addition, the salary of the SLC CEO was slashed by \$50,000 to \$150,000.

Are we better off? The American Library Association and the National Education Association, two of the biggest supporters of the program, do not think so. They decried the reduction of funding as a tragic loss to our nation's children. Sen. Stevens and other strong critics of the program do not think so. They think that the FCC "blew it" and that the Schools and

Libraries Program should be killed off. And what should the Internet industry think? Well, we have ourselves yet another 100-page order to deal with and another significant change to the rules, even though the program, at the time of this new Order, had not even shelled out its first dollar of Internet support. The word is that many small-and medium-size- providers have simply given up on the

program as too complex, as lacking assurance that the providers will be timely paid, and as favoring the telephone companies. This latest round does little to respond to Internet concerns.

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# MANNING THE WIRES

by Ric Manning

#### CABLE NEWS LEADER CNN AIMS TO BE WEB VIDEO LEADER

A merican television networks
constantly invite viewers to
log on to their companion sites on the
World Wide Web. But none of them have
been as successful as CNN in integrating
their broadcast content with their online service.

When the United States was making noises about bombing Iraq earlier this year, CNN Interactive (www.cnn.com) created a special map showing all of the countries in the Middle East. Visitors who clicked on Saudi Arabia, for example, got the latest report on that country's position in the controversy.

During one of the television segments, a CNN reporter went on the air to show the map and explain how it worked. Visits to the Web site soared.

"It was a very interactive and attractive way of presenting the information," said Kerrin Roberts, a spokesman for CNN Interactive.

Another time the network aired a special report on taxes. Guests who were interviewed on the air answered questions submitted from CNN's Web site, then stayed around after the interview to answer more questions online.

Roberts says many CNN reporters have begun contributing special Web-only

reports and using e-mail and the network's Web site in their work. Reporter Rajee Suri recently won an award for his multimedia presentation on India and Pakistan after 50 years of independence. And John Holliman, CNN's chief space reporter, often gets e-mail tips from viewers.

"People will tell him to ask a particular question next time he interviews someone at NASA," said Roberts.

CNN's strategy of integrating its Web site with its television activities has helped the network lay claim to the world's most popular news site on the Web. According to Roberts, CNN Interactive served about 75 million page views in a typical week, a rate that increases about 9 percent every month.

On days when a big news story is breaking, the site might deliver more than 18 million page views. In the month after Princess Diana was killed, page views jumped about 30 percent.

CNN Interactive's staff of about 240, support eight separate Web sites, including specialty sites devoted to sports, politics and financial news. With about one-fourth of CNN Interactive's traffic coming from outside the United States, the network has also devoted new resources to Web projects aimed at foreign viewers. In addition to the English language site, CNN has three foreign language sites that serve news in Spanish, Swedish and Portuguese.

At CNN headquarters in Atlanta, the Web newsroom is staffed in three shifts, 24 hours a day, just like the broadcast newsrooms. On a recent Saturday afternoon, five writers (calld associate producers) and a Web Ma-

ster are working a dozen stories posted on a large whiteboard.

The APs draw on material from wire services and reports filed by the network's correspondents. Because the correspondents don't often file a copy of their script that often means listening to a live report and transcribing the words.

That process isn't much different than the routine at most news Web sites. What makes CNN

Interactive different is its heavy emphasis on video. The site stocks 3-5 hours of streaming video. Its "video on demand" feature delivers clips from a dozen news stories, in RealVideo or NetShow formats, plus segments from popular shows such as "Larry King Live" and "Crossfire."

Roberts said despite its small display and limited quality, streaming video is popular with CNN's Web audience. When CNN offered live coverage of Princess Diana's funeral, Roberts said all 1,400 streams were snapped up in minutes.

CNN also uses the Web to deliver live coverage to smaller audiences. CNN chose not to provide complete coverage of Congressional hearings on campaign spending earlier this year. But hard-core viewers could follow the hearings live on CNN's Web site.

columnist and web master for The Courier-Journal in Louisville, Kentucky. His weekly column covers computers, consumer electronics and the Internet and is distributed to more than 100 newspapers by the Gannett News Service. It's also available on the World Wide Web at http://couri er-journal .com/gizweb.

Ric Manning is a

Ric was the founding editor of Plumb and Bulletin Board Systems, two newsletters that covered the BBS arena in the early 1980s. His freelance work has appeared in several magazines including PC/Computing Mobile Office, PC Week and Home Office Computing. Ric lives in Southern Indiana with his wife, two children and two Weimaraner dogs. He can be reached at ric man@iglou.com



#### THERE ARE ENOUGH COMPLEXITIES IN LIFE. CONNECTING TO THE INTERNET SHOULDN'T BE ONE OF THEM.

Creating an Internet presence can be a frustrating experience, even for the expert. Beyond the web server there are routers to make the connections, FTP to move the files, and e-mail servers to give your mail a home. And don't forget the Domain Name Server that's required so the world can know your name. Even after you gather all the pieces, you still have to integrate them. And the costs, in time and money, can be staggering. But now there is an easier way.

#### THE INTERNET PRESENCE IN A BOX

The Internet Protocol Adapter (IPAD) is the only product that fully integrates a router, terminal server, and core Internet services (e-mail, DNS, unlimited WWW and FTP servers) into a single device. With all the necessary internal and external connections, Domain Name Service, and other required functions, the IPAD includes everything you need to easily establish a complete Internet presence. In fact, it's so complete, you can add remote access by simply plugging in modems and dialing in with any Internet compatible computer.

#### BUILT WITH PERFORMANCE AND DURABILITY IN MIND

The IPAD's capability is housed in a rack-mount chassis of battle-ready construction. Its custom software,

optimized for the Pentium processor, yields an unprecedented combination of performance and durability that you can never get from a general purpose operating system. The IPAD may be easy to use, but it's no toy.

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Router Softwore Configuration Time Configuration Cost Sub Total	Included Pre-configured —	\$1800 1-3 hrs \$70 Avg \$1870
System 5oftwore 0/5 Configuration Time Configuration Cost Sub Total	Included Pre-configured — —	\$895 5-30 hrs \$61S Avg \$1510
Web Server Configuration Time Configuration Cost Sub Total	Included Pre-configured — —	Included 3-25 hrs \$490 Avg \$490
FTP Server Configuration Time Configuration Cost Sub Total	Included Pre-configured — —	Included 1-2 hrs \$SO Avg \$50
ONS Server Configuration Time Configuration Cost Sub Total	Included Pre-configured — —	\$49S S-80 hrs \$1600 Avg \$2095
E-Moil Server Configuration Time Configuration Cost Sub Total	Included Pre-configured — —	\$580 10-100 hrs \$1900 Avg \$2480
Support Costs Per Yeor	\$79S Includes Hordwore ond 5oftwore Protection	\$2100 No Hordwore or Softwore Protection
Number of Vendors	1	S
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#### PLUG 'N PLAY AND WALK AWAY

Many products claim to be easy to use, but the proof is in the time you spend getting it up and running. With other products you have to *learn everything* before you can *do anything*, and with the Internet there's a lot to learn. Only the IPAD allows you to get started immediately, and learn as you go. Information Week said of the IPAD "from box to working system in two hours even with mistakes."

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#### GO WITH A WINNER!

InfoWorld Magazine said "The IPAD represents an elegant solution when you need to easily build an Internet or intranet presence. Considering the time it saves you, the price represents a good value." In 1995 John C. Dvorak gave the IPAD his PC Telecommunications Excellence Award because he recognized the IPAD advantage.

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CNN will also use its Web site to serve up a extended videos that viewers won't see on the air.

"When we did a 24-part special on the Cold War, correspondents spent five hours with Fidel Castro," said Roberts. "Only a few minutes of that interview will get on the air but we can offer a 20-minute segment on the Web."

In some cases, CNN Interactive sends its own teams into the field. For example, a special crew went to Germany to shoot video footage and 360-degree images to be used only on the Web.

CNN executives expect the Web site to become even more popular as cable modems and other fast-delivery options make Internet video more like television.

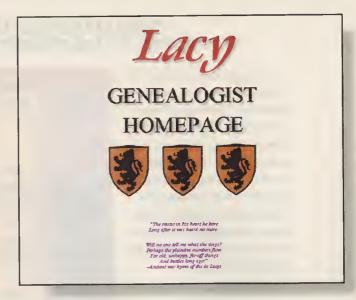
"We are the video powerhouse," said Roberts. "We have the ability to do it. Why wait?"

#### **GENEALOGY MEGASITE**

Steve Lacy said he didn't start out to build the world's largest genealogy Web site — he just wanted to help his mother find a hobby after his father died.

"She just needed some type of activity to occupy her time and interest," he said. "So I gradually began trying to introduce her to genealogy, which some friends suggested to me. Then I became hooked when I found that my family had some interesting historical ancestors. As Mom and I began to explore the





family genealogy more and more, she became more active and positive about life and I became more enthralled with the family history."

In 1995, Lacy developed a family history Web site (www.gen gateway.com/lacysite.htm) devoted to the Lacy ancestors from England and France who came to the United States in 1796 and were among the first pioneers in Southern Kentucky.

"As I found more and more online resources to utilize in building our lineage, I also found these resources to be extremely helpful to my friends, so I started building a personal bookmark file," he said.

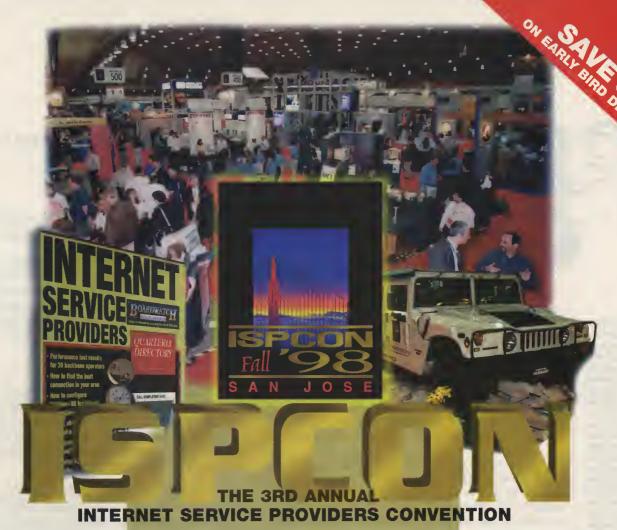
That collection of bookmarks grew to more than 800 links that he eventually posted on the Web, where anyone could use it. Today Genealogy Gateway (www.gengateway.com) has more than 41,000 listings and is often ranked among the best genealogy research sites on the Web. The site also has a corporate sponsor, Broderbund Software, which uses the site to advertise its Family Tree Maker software.

The bulk of the site is made up of links to other surname pages, organized alphabetically from Abernathy and Acheson to Zwerts and Zwojda. Many of the family name sites offer bulletin boards where people can request information about specific ancestors.

Other links take you to U.S. Census data, professional researchers, surname search services, ethnic group information, obituary records, military records, historical maps and information about family crests and heraldry.

Lacy said the most popular areas are a surname search form and an option that lets you automatically list your surname.

The site isn't likely to win any design awards, but it is truly a reflection of its motto: "Where substance takes precedence over style." ◆



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## MARKETING 101 for ISPs

by Michael Greenbaum

#### THE STRATEGIC MARKETING PLAN PART II

Last month, in Part I of this column, I asked you to complete a Situation Analysis that included: What business are you really in? What is your company's vision? Do you have any external limits on the business? What is the competitive environment?

Your strengths and weaknesses based on last month's column provided the database for The Strategic Marketing Plan. In each of these areas you should have concentrated on analyzing those trends and developments which will actually affect your company. With the analysis complete you are ready for the most important and difficult step: setting the objectives and strategy. If this is not done well all else will be of little value and possibly work at cross-purposes.

The investments you have already made in collateral, trade shows, customer communications through the call center and in presenting the bill are the ingredients for The Strategic Marketing Plan you are about to write. To see yourself as others see you make sure you express it in terms of the 4 Cs: customer wants and needs, complete customer cost, convenience of the customer in getting your service and communicating with the customer. Success in this plan, and in your business, will come from matching your capabilities with the needs and wants of your customers to achieve mutually beneficial relationships.

#### THE STRATEGIC MARKETING PLAN

Let's begin with some ground rules. To gain perspective on your business I suggest you look out over three years. This amount of time is of practicable use to give direction to your business and not so long as to be pointless in an industry as dynamic as ours. The plan must be in writing but should not be overly detailed. You will have to make assumptions about some things before the plan is written. These should be few in number. One test for whether an assumption is needed might be to consider if the results of the plan could be made irrespective of this assumption. If this is true, then an assumption is unnecessary.

In defining the market (all the products and services that appear to satisfy the same customer need) you need to strike a balance between too narrow, where the range of new business opportunities is too restricted, and too broad, where you cannot even do a practical marketing plan. Correct market definition is crucial for you to succeed in measuring your share, measuring your growth, specifying target customers,

and recognizing competitors and the realistic formulation of marketing objectives and strategies.

To achieve success, marketing objectives can and must be measured. Directional terms such as maximize, minimize, penetrate should be acceptable only if a quantitative measurement can be attached to them. If you cannot measure it, you cannot manage it. Nor will you be able to improve on it next year!

#### STRATEGY AND TACTICS

Segmentation is one of the key determinants of successful marketing planning and is the basis for matching your capabilities with customer's needs. Its purpose is to provide your company with an advantage over your competitors by showing where you can provide greater value to your customers.

Marketing segments, also known as market niches, refer to all those buyers who display similar responsiveness to a particular marketing positioning strategy. These similarities are indicated by the amount and frequency of purchase, loyalty to a particular brand, and other measures of responsiveness. Your segment should be large enough to provide you with a good return for your efforts. Members must have a high degree of similarity yet be different from the rest of the market, and be reachable, meaning to know how to communicate with them using marketing tools as advertising, public relations, point of purchase promotion, etc.

In preparing your database, you have probably found that a small number of your customers account for a large portion of your business. This is commonly referred to as the 80/20 rule or the Pareto effect, whereby 20 percent of the customers account for 80 percent of the revenue. This effect is found in all markets and has a clear implication: marketers need to focus efforts and programs on high volume customers. One of the most important tasks in developing the Strategic Marketing Plan is to choose the best 20 percent of your market, the characteristics they share, and focus on it. Keep in mind that this 20 percent needs top management relationship building to keep their loyalty.

The remaining 80 percent of the customers probably will group themselves into two or maybe three more groups, which also exhibit similar broad characteristics as others in their group. This does not mean that you should write off the low value customer. Look

Marketing SWOT Team, a New York City based marketing consulting group focusing on bringing the benefits of outsourcing to the marketing function. He is a former vice president of sales and marketing at AppliedTheory. He also held senior management positions in the software, Internet, online services and hardware industries. At Borland International he was vice president of marketing responsible for all marketing and public relations functions, including the annual user's conference. As a vice president at Bell Atlantic Internet, he was responsible for thecompany's strategy to develop an Internet presence and later to be an Internet service provider. Before that, he was general manager of Prodigy Services Co., the

pioneering online

service and was

applying the ease-of-

use characteristics

of the consumer to business applica-

tions. His business

experience began in sales, marketing and

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ment with IBM.

instrumental in

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Revenue Sharing Opportunities — Total Internet delivers unique revenue sharing opportunities that enable ISPs to increase their revenue while their users navigate the web.

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beyond the current revenue and ask yourself: Can I provide other services that would move this customer into a higher revenue category or is it costing me so little to support this customer that I really move a good portion of the revenue to the profit line?

To segment your market you must answer the following questions: Which customers are buying what services? Why are they buying that service? What are the common characteristics that make them a segment? Now go one step farther down the channel and describe your services benefit to your customer's customer - the end user. Your share of the customer's mind goes up when you make your customer a success. Without this you will be just another company selling "me too" Internet services and, in the absence of value, only low price will get you customers.

Now return to the situation analysis and look at the benefits you bring to your customers. This list must be exhaustive and not take any features of the services you offer for granted your customers won't when they consider from whom to purchase. Give time to the benefits that come from the product, the benefits that come from doing business with your company, such as financial terms other than price, cost of communications connections to get your service, hours of support, depth of support, and your reputation.

Be sure to consider benefits that differentiate you from your competitors. As important as is the clarity of this competitive assessment in the marketplace, it is even more important internally for it directs your staff to look in certain areas for great ideas. These great ideas will build on your competitive advantage! If you cannot identify any of these differential benefits then your offer is identical to your competitor's (highly unlikely) and you need to relook at this. It is in the area of differential benefits that your greatest chance of success lies.

Segmentation is not something you can do once and forget. Because markets and customers are constantly changing, the segments are constantly evolving. In fact, a single customer will appear in multiple segments as you go through different stages of the service life. A seismic research firm with three employees and a mid-size manufacturing company with 500 employees who are just becoming Internet savvy might get the same announcement of a new high bandwidth service. If the criteria for segmenting were support service offerings you might group the manufacturing company with the hospital and the community college as all would have a large number of users, turnover of employees, etc.

Market segmentation, if done correctly, will help you determine how to best focus your company's resources and efforts to create differential advantage and customer value. It will also help set realistic and achievable marketing and sales objectives and improve decision making by forcing managers to consider in depth the options that lie ahead.

Marketing channels are how your services move from you to your customer. Many companies use multiple channels to reach their customers involving one or possibly several intermediaries where the intermediary has the role of providing the widest possible marketing coverage at the lowest cost. An example of this is using LAN integrators as sales agents for ISP services to reach particular markets where detailed knowledge of the customer applications and equipment configurations are an important part of the sale. At the other end of the spectrum is the intermediary you use because of the premium value the customer places on the knowledge the intermediary has of the customer's business.

The potential exists for considerable conflict between you and your channel partners and may affect the relationship with the customer. This is a complex area and will be the subject of a separate column.

Return to your situation analysis and your segments and evaluate the costs of service provision, sales, and marketing, and other terms of your offer against the benefits of each marketing channel. Decide on a combination that gains the market coverage you desire at a cost revenue trade-off you can afford.

Let's examine where we have been. Last month, we started with lots of information about our business and then did some analysis on it. This month we focused our activity through the lens of two principal drivers of the marketing plan, segmentation and channels. With something on the order of 80 percent of your revenue coming from 20 percent of your customers you can now set the most important goals for your business. I'd welcome e-mail from you on questions you might have about this material or whether I should explore marketing planning further in a future column.

Remember. . .

There is no such thing as a ready-made strategic marketing plan. It requires that you sit back and think deeply about your business and its direction. Success in this comes from experience. Experience comes from honest input allowing no vague terms and hiding nothing. Focus your situation analysis on segments that are critical to your business and concentrate only on the key factors that will help you make your objectives. Follow this by making decisions, evaluating results and going through the cycle again with the results as input to the new cycle.

#### **RESOURCES**

www.entreworld.org is a site sponsored by the Kauffman Foundation's Center for Entrepreneurial Leadership. There is a wealth of material for entrepreneurs with links to many other sites with resources for startup businesses. It also includes discussion groups for you to share your ideas, tips and experiences.

www.bplans.com/marketing.htm has some sample business plans that are valuable examples.

www.vcu.edu/rrtcweb/overview/mrkplan .html provides a useful step by step guide to creating your plan.

www.rpls.com/features/strat1.htm has an excellent strategic planning paper as a reference document.



## Rev Up Idle Time With 112k Channel Bonded Service

#### New Technology Generates New Income

Transend invented channel bonded modems, and is the world leader. Transend's new Gemini 112k modem is the second generation of this technology, and has incorporated key features, like security, call waiting, simultaneous voice and data, and easy "plug-and-play" configuration and no special software is required. Of course the Gemini features blazing speed, using regular phone lines. It works with any operating system, such as Windows95, 98, NT, Unix, Linux, even Macintosh.

Transend has developed an easy formula for pricing the premium 112k Channel Bonded Service. Through it's ISP Partner program you can access all Partner benefits. This formula shows just how much additional revenue you can make by implementing Gemini 112k Channel Bonded Service.

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onday through Friday, from 9:00 AM to 6:00 PM, everyone is busy at work, right? Well, not if you're an ISP. In fact, only 25 to 30 percent of most ISP's capacity is used during normal business hours.

However, some ISPs have found a new way to rev up their idle servers and make more money. They're generating new revenue by offering business clients and power-users a dial-up connection that delivers far greater speed and throughput. Best of all, your clients are using the phone lines they already have, and ISPs are making better use of their phone lines, too.

#### What is 112k Channel Bonded Service?

Based on proven modem technology, Channel Bonded Service seamlessly binds two standard dial lines into a powerhouse that doubles speed and throughput, all over current telephone infrastructure. Channel bonding offers a cost-effective means of providing faster data access without the high costs and headaches associated with ISDN and other digital technologies.

#### An Affordable High-Speed Internet Connection

Because of its ultra-high-speed performance, channel bonding is perfect for telecommuters, serious web surfers, SOHO, remote offices, and anyone who wants high-speed access to the Internet. Clients can still use their second phone line for telephone calls or their fax machines. When a phone call comes in, the channel bonded modem automatically drops one line, but continues to send data on the other. When the user hangs up, the modem automatically reconnects and resumes processing at 112k.

#### 112k Channel Bonded Service is Easy to Implement

Because most recent remote-access servers, like Livingston, Ascend, and Total Control, already have built-in channel bonding capabilities, ISPs can easily combine two channels by implementing the MLPPP option in their RAS. No other equipment or software is needed.

ISPs running on analog lines, using communication servers with external modems, can also provide Channel Bonded Service by using a channel bonded modem at their POP.

#### How Much Can an ISP Make?

ISPs that currently offer 112k service typically earn \$10 a month premium or more over 56K service. It's no wonder that ISPs are flocking to this new technology: by using lines and equipment that used to lay idle all day long, this revenue becomes almost completely profit.

## THE MONEY TREE

by Dana Blankenhorn

#### BUBBA SHAKES THE WEB MONEY TREE JUST LIKE THE SMARTIES

Let's start with my own biases.

The Internet, unlike every other medium, lets a business find its prospects, lets it turn them into buyers, handles the transaction, and provides customer service. The way you succeed in this medium, as in those that have gone before, requires that you take advantage of everything it can do.

Dana Blankenhorn began his online writing career in 1983, doing business as d/b/a @ Have Modem, Will Travel. He started CMP Media's Interactive Age Daily, the first online publication covering the Internet, in 1994.

Among his book credits are Bulletin Board Systems for Business, (1991) with Lamont Wood, and Web Commerce, (1998) by Kate Maddox, both from John Wiley & Sons. Regular clients include Advertising Age's "Net Marketing," PlugIn Datamation (www.datama tion.com) and the Chicago Tribune. He also produces A-Clue.Com (www.a-clue .com), a free weekly e-mail newsletter covering electronic commerce, from his home-office in Atlanta, Georgia. A quick look at history proves the point. Newspapers in the 1850s worked like the Web, with a different penny paper for every party and ethnic group. New manufacturing technologies, developed in the 1880s, eventually raised the cost of entry and made for today's monopolies. At first, radio was seen as a point-to-point medium. Then

KDKA in Pittsburgh broadcast the 1920 election results and the world changed. TV was just radio with pictures until "I Love Lucy" began to use film to stretch the medium's possibilities in 1952. So it will be with the Internet. Ads won't do it, communities won't do it — transactions will drive the medium forward, and pay everyone else's bills (including yours).

One of the great, common misconceptions in this new medium is that there's a limited amount of mind share. There can only be so many portals, so many major content sites, so many valid communities, so many ISPs. We think of it as we do broadcasting or mass-market newspapers, and forget the low barrier-to-entry that makes the Web more like the penny paper of the 1850s. **Boardwatch** readers know the fallacy of the assumption — if you find a niche, serve your customers, and offer personal service, you can do things no national competitor can match. So it is in other fields, and that's a fact you can profit from.

Take computer sales. Dell (www.dell.com) has become the 800-pound gorilla in this space by seizing the Web opportunity for its build-to-order business strategy. It's extended its reach through "Premier Pages," for large customers, colleges, and the like, which it hosts on its site and which include the specific discounts, and configurations, available to each customer. In June Dell extended the program, eliminating paper on sales to its top 3,000 customers, starting this fall.

Making all this work is, essentially, an ODBC call, a link between the Premier Page (carrying its customer information) and Dell's databases for building, shipping, and billing sales. It's not as high-tech as some make it sound — an order is still e-mailed to a real salesman, who then submits it to the billing system. The salesman remains a vital part of the process, setting up the account billing and managing the relationship. But it does blow the current capabilities of other big PC makers — Compaq (www.compaq.com), HP (www.hp.com), and Gateway (www.gateway.com), out of the water.

How do you compete? Where's the fat? No matter how well Dell does it, I can see two big hunks of fat right away — the cost of maintaining the brand through ads, and the profits needed to keep Wall Street happy. You can copy build-to-order on a small scale, focus your marketing budget, and make some money for yourself and an ISP.

Let's look at two examples; one aimed at experienced buyers of PCs, the other aimed at naïve buyers.

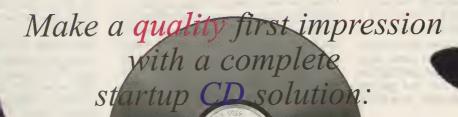
#### **PCs FOR SMARTIES**



iDot.com was launched in Austin this April, just a few miles south of Dell's huge plant in Round Rock. Mark Marlow, formerly with Power Computing, is vice president of product marketing. He has a 22,000 square foot manufacturing facility - the same building houses the

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Windows NT server on which the business is based. The server currently has a single T-1 connection from Time Warner's Internet unit. Marlow says the ISP was chosen because his team felt confident they could get fractional T-3 service and multiple T-1 drops down the road.

What makes iDot go is, of course, its business model. "We started as a 100 percent Internet company," he says. "Dell's indicated they'll be there in 3-4 years." As a result, "our overhead is far lower than theirs." Because of the location, "we're tapping into the same supply base," and while he's not getting the same pricing on parts, he's not paying for operators, direct salesmen, or a lot of engineers, either.

Another key is iDot's "configurator" application, through which prospects can get a price on a specific machine and deliver their orders to the factory floor. For one thing, it's custom-built. "A lot of solutions" Marlow saw from vendors "were database-specific, which we felt would create problems if we moved" to a new database supplier. Then, "as we described the functionality we wanted the suppliers started talking about all these contract programmers that would have to be brought in — it would cost us

as much to do that as to design the software ourselves."

The result was that iDot, again taking advantage of its location in the belly of the beast, hired some of the programmers who'd done Dell's site. The business was capitalized January 1, and launched April 21.

If you've used Dell's "configurator," for instance, which allows you to configure a machine to your own requirements, you'll see that iDot's offers a wider range of choices. "We have pop-up windows that explain" differences between various parts as well. "We allow greater flexibility and more customization." Marlow's also taken advantage of his small size by building an "upgrade center," through which his customers can ship him back products that need faster chips, new disk drives, or more memory.

When orders come in, they're printed in a locked room off iDot's shop floor, where hard drives, memory chips, and expensive CPUs are stored. "The components are picked, taken to the assembly line, and build to order occurs," he says.

The real key to competing, however, is marketing, he says, knowing his niche.

Marlow bills iDot as offering "PCs for Smarties," advertising in computer trade magazines as well as through Web banners. That assumption is built into his technology plan. Users can save a configurator session for a week, as a formal or informal quote, and when they return they can even get a new quote - if component prices have dropped in the meantime, they get the benefits. "That lets people shop before making a decision." As a result, Marlow says, the company's right on schedule, ramping up dozens of sales a week, while the site and the operation is scaled to hundreds of sales a week. Making that thousands may mean adding new servers for specific portions of the operation, adding T-1s or fractional T-3s, maybe adding a second ISP for redundancy. But, so far, iDot has proven if you have a niche, you can win.

#### **PCs FOR DUMMIES**

In Atlanta, Bart Brannon has the same basic product, but a completely different business strategy with a longer record of success.

Brannon is president of StupidPC (www.stupidpc.com), launched a year ago to offer basic, low-priced machines in north



Georgia with complete support — and the possibility of national expansion. So far, the plan's working well.



StupidPC, which is hosted by Mindspring, occupies 10,000 square feet of office-warehouse space in the Atlanta suburb of Norcross, capable of producing 1,500 machines per month (he presently does about one-quarter of that). Brannon opened a second shop in Orlando, Florida, in late June.

Brannon's value proposition is simple. He uses radio and print ads featuring a character named

"Bubba," (actually sales manager Jimmy Cagle) to offer complete systems priced at under \$1,000. The price includes delivery, setup, and a few hours of training. Brannon has a collection of vans, driver-owned vehicles and VW bugs, emblazoned with his logo, delivering the machines from Macon in middle Georgia up to Dawsonville in the north Georgia mountains, wherever his advertising can reach.

The store gets some walk-in traffic, and the Web site offers ads for his specials, as well as FAQ files so users can troubleshoot simple problems, and a forum for owners that creates a sense of community. He recently hired his first full-time Web Master, but there's no rush to add online ordering — buyers who go through his "configurator" are actually selecting from a series of menus and sending him an e-mail. Most sales are closed by telephone — most sales are within a local calling area so callbacks are no problem.

It's marketing, not technology, which makes StupidPC a success, Brannon admits. The ads are aimed heavily at sports fans and other non-technical users. The splash screen in front of the site reads "It's so simple, it's" — followed by the StupidPC logo. "Bubba is a good old boy who enjoys working with folks, who knows PCs and puts things in layman's terms," Brannon says. "He does the commerials, writes the spots, he used to sing in a country band and we grew up together."

StupidPC proves that you can sell, online, simply with attitude and value, allowing complex e-commerce systems to wait for the business to grow. Meanwhile, iDot proves there is a niche for low-prices in high-value markets, even competing against big boys like Dell. Both prove that e-commerce is actually simpler, and more basic, than most experts suppose. Know your market, know your marketing, deliver on your promises, and you too can sell successfully online. That's a message you can take to your client base (with examples) both of you will profit from. •

#### **CONTACT INFO**

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BIG BOARD BRIEFS by Wallace Wang

#### AT&T TRIED TO BUY AMERICA ONLINE

cently tried to buy America Online in a desperate attempt to grab a share of the lucrative Internet market befor it slips completely through their corporate fingers. According to London's Financial Times newspaper, AT&T Chairman Michael Armstrong approached AOL with a plan to pay "comfortably above" AOL's market capitalization of \$19 billion. But AOL chief executive Steve Case and its chief operating officer, Robert Pittman, turned down the offer in a surprising fit of logical thinking.

elecommunications giant AT&T re-

The fact that AT&T wanted America Online proves that AT&T has already lost any chance of capitalizing off the Internet. Perhaps AT&T will become like Western Union and fade into the corporate world of insignificance where they belong. In the meantime, America Online keeps attracting new subscribers and thus new advertisers and strategic partners. Of all the online services, only America Online understood that the real money wasn't in individual subscribers but in advertising revenue (and creative accounting to cover up massive losses by making them look like additional profits).

AMERICA ONLINE SIGNS PACT WITH PACKARD BELL, COMPAQ, AND IBM

While the Department of Justice is busy annoying Microsoft's attempt to bundle their Internet Explorer with Windows 98, America Online is busy making sure that their software appears on computer screens all over the world. America Online recently signed a marketing agreement with Packard Bell NEC, Inc., the third biggest supplier of computers in the United States, which means all Packard Bell computers will feature AOL as the preferred Internet online service (accompanied by the further demise of the Microsoft Network down the drain).

Besides offering the America Online software, Packard Bell will also promote CompuServe within the initial setup process on its personal computers with Windows 98. That way users can choose to sign up for either CompuServe or America Online, shoveling money towards America Online as long as they choose one of these online services.

Continuing their desktop dominance, America Online also signed agreements to put their software on computers made by Compa and IBM. Aptiva and ThinkPad users will be able to access the pre-installed America Online software by clicking on an icon displayed prominently on the computer's desktop or front screen. America Online software will also be packaged with IBM-branded consumer modems.

So if you buy a brand name computer, expect to see America Online's icon staring back at you from the computer screen. With so many copies of America Online cluttering the latest computers, perhaps some shareware programmer could make a bundle selling an uninstaller program that only removes software provided by America Online.

#### **AOL SETTLES SHAREHOLDER LAWSUIT**

AOL has agreed to pay money as part of a preliminary settlement with shareholders who owned its stock between Aug. 10, 1995, and Oct. 25, 1996. "We're pleased to put behind us this suit regarding events in 1995 and 1996," said George Vradenburg, AOL senior vice president and general counsel. "We believe a lengthy and distracting litigation process is not in the best interests of AOL's members, the company or its shareholders."

The case focused on America Online's aggressively creative method of accounting for marketing costs, which AOL altered in October 1996 after criticism by Wall Street analysts. During the period when AOL was flooding the market with free sign-up disks, they deferred hundreds of millions of dollars in marketing costs instead of immediately expensing the costs in adherence with conservative accounting principles embraced by most major U.S. companies.

Responding to criticism of the practice, which analysts said artificially boosted the short-term profit reports of the company, AOL changed their accounting practices in October 1996 and began charging marketing costs to the quarter in which they were incurred.

In making the switch, AOL announced that it would take \$460 million in charges spread over several quarters to cover the new accounting system, which, in effect, wiped out years of the company's previously reported profits.

Wallace Wang is the author of CompuServe For Dummies, Visual Basic For Dummies. More Visual Basic For Dummies, Microsoft Office 97 For Dummies, and More Microsoft Office 97 For Dummies.

When not working with computers, he performs stand-up comedy and has appeared on A&E's Evening at the Improv TV comedy show. He can be reached via e-mail at 70334.3672 @compuserve.com, bothekat@aol.com, bo\_the\_cat@ asn.com, O bothecat@ prodigy.net

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verybody thinks the Internet is cool, but if your business is to develop, implement and maintain the Internet you need to read **Boardwatch Magazin**e.

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AOL shareholders who dumped the stock during the period in question may have suffered losses, but those who held the stock since August 1995 have watched the value of their shares increase a staggering 447 percent, adjusting for stock splits.

#### HIGHER SPEEDS ON AMERICA ONLINE

America Online plans to fully deploy the International Telecommunications Union standard V.90 modem protocol for high-speed 56 Kbps access throughout its network. So this either means AOL subscribers will be able to access the service at the higher speeds of their modem or that they'll just get busy signals faster than before. Still, this upgrade is significant because while America Online is busy rolling out V.90 modem access, CompuServe (America Online's "other" online service), is still struggling with just a handful of 56Kbps modem access numbers and an even smaller number of ISDN access numbers.

Looks like America Online gets all the new toys while CompuServe is left to struggle with minimal equipment. All of which makes CompuServe's mission statement look even sillier. In case you haven't read CompuServe's mission statement, here it is:

"Our mission is to serve those people who are serious about all their activities . . . work, family, and leisure and who can improve their lives with the time-saving benefits of the Internet online world."

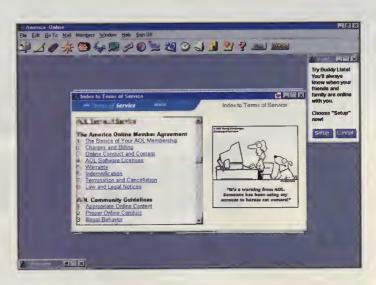
Chances are good that the people who can improve their lives using the Internet have already taken that first step by choosing not to use CompuServe. Maybe CompuServe's executives were busy brainstorming this mission statement while their online service business fell apart around them. Perhaps the company should give these executives more million dollar bonuses and lay off the people who are actually doing any work.

#### AOL AGREES TO CHANGE CONFUSING "TERMS OF SERVICE" CLAUSE

In yet another embarrassing public relations spectacle, America Online has agreed to revise a clause in their updated Terms of Service (TOS) policy after getting some painful feedback from its users. The updated clause clarifies the intellectual property issues raised when members post information to public areas on the service, such as message boards, forums and the Member Directory. The clause used to read: "By submitting content in these public areas, you grant to AOL and other members the complete right to use, reproduce, modify, distribute, etc. the content in any part, anywhere."

The revised clause will now read: "Other members will have access to your posted material and might copy, modify, or distribute it. By submitting content or posting there, you are representing that you are the owner of such material, or have authorization to distribute it. By submitting content in these public areas, you grant to AOL the complete right to use, reproduce, modify, distribute, etc. the content in any part, any where. "

The revised wording means that AOL is retaining its rights to users' content, but is no longer extending that right to other

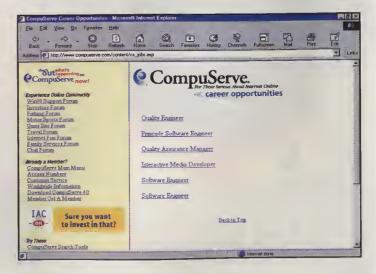


members. Many AOL members, in particular members of the Free Form Gaming Forum (FFGF), an AOL area for participants of role-playing games in the Dungeons & Dragons tradition, felt that the original wording meant that they were relinquishing any rights to material they created. Many FFGF members swamped AOL with questions demanding clarification, but some dismissed the clause as "sheer idiocy" and "illegal," accusing AOL of "covering their corporate ass" at members' expense.

Kara Berrine, who led the protest against the new TOS, has been a member for four years. She says she was drawn to the forum because it was a place where she could share her work. She called AOL's new policy "unconscionable."

To Jeremy Gray, a forum member for three years, "AOL has a responsibility to protect the community. . . The TOS basically shows that AOL doesn't care about its members, especially its members who are writers, who also happen to be their long-term members."

Many members even threatened to pull all their material from the service. "I'll pull everything, I'll pull all posts. I'll go through all [archive] folders and pull it all," said Natalie Bittenbender. The threat raised a serious question: If the FFGF archives were stripped of their posts and no member ever posted their work again, where would the community be?



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FFGF members reported that their attempts to clarify the issue with AOL were met by silence, conflicting answers or form e-mails.

Though the language still grants AOL the right to members' content, Primrose noted that the reason AOL must do this is mainly technical. In order for AOL to provide such services as message boards, forums and e-mails, it needs to upload a user's material to its servers, which is considered making a copy of the user's work. The TOS policy allows AOL to freely distribute those "copies" on its service without violating copyright laws. In other words, AOL is still covering their own butts, but at least they've managed to keep their members happy (for now).

#### WORK FOR COMPUSERVE

After spending most of 1998 with their Web site virtually abandoned, CompuServe is slowly providing timely updates about what's going on with the company. One of their latest postings is a list of job opportunities at CompuServe. So if you ever wondered what it would be like to work for a has-been company that has little hope of becoming a leader or innovator in anything, consider switching jobs and working for a loser like CompuServe.

CompuServe is looking for software engineers (most likely in a vain attempt to help them update their Web site more often). If you're interested, contact CompuServe Interactive Services,

5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, Ohio 43220; Attn: Deanna Springs, 0002 (Email: dsprings@csi.compuserve.com or fax (614) 538-1780.)

#### TROJAN HORSE STEALING AOL PASSWORDS

A juvenile pleaded guilty to stealing more than 500 passwords from America Online users. The youngster, called "John Doe" in court papers, pleaded guilty in Manhattan federal court to one count of unlawful interception of electronic communications.

Prosecutors said that the juvenile stole the passwords by using a "Trojan Horse" computer program that he sent to other AOL users via an electronic mail messages that contained an attachment. When users received the e-mail message and "clicked" on the attachment, the Trojan Horse programs would activate and start recording the AOL users' keystrokes, including their passwords they typed in.

So if you ever get a message from a stranger on AOL, be wary of downloading any file attachments. These files could be Trojan Horses, computer viruses, or some other program designed to take advantage of you (such as any software provided by America Online). ◆

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## STREAMING MEDIA by Doug Mohney

#### STATE OF THE UNION FOR STREAMING MEDIA - PART 1: TECHNOLOGY

hen I started writing this column about a year ago, I stated that Internet broadcast technology was in the first year of a three to five year developmental cycle before it would become developed enough to give analog broadcast television a run for its money (advertising dollars, more accurately). My ad hoc test for success, the "Moo" test for lack of a better term, set the following parameters for success:

- True, full screen, 24 frames per second video on the consumer desktop, equal to the picture quality of current NTSC analog broadcast video.
- · A live show or event that would draw a verifiable audience of 10,000 distributed users on the Net, in the privacy of their own homes (not corporate or university).

Meet those two conditions - technology and content and you've got a potential replacement for current analog broadcast television. I also noted that it's unlikely that we'll see a replacement of traditional broadcast infrastructure and organization within that five year time frame; i.e. we won't be seeing the Super Bowl exclusively cybercast.

One year has elapsed, so it is time to take stock of the evolution of Internet broadcast in both aspects, technology and content. Technology has to evolve in order to support the quality consumers are going to demand and to draw in the large numbers of viewers that advertisers will demand. Furthermore, there will have to be unique content, shows and video that make people shift away from analog TV and cable, content that makes people go out of their way to use the new technology. If we look at analog TV, people started getting cable and digital satellite receivers for better picture quality and the additional variety of content available.

#### **TECHNOLOGY**

From a technology development standpoint, if ISPs and "the Internet" can meet the standards of Moo's Internet broadcast test, other applications, such as voice over IP, should be a cakewalk. If you can deliver large numbers of 500K video streams across the Net with good quality of service, setting up 56K phone calls should be trivial.

#### THE TECHNOLOGY TRIAD

Three basic technologies have to evolve in order to deliver high-quality video to the home: Hardware on the consumer desktop, software for encoding, clients, servers, and management, and affordable bandwidth to the consumer desktop. Some people are going to argue for a fourth leg: network/backbone improve-

ments. I'm going to waive my hands at two different network issues that DO impact streaming video delivery because I know they aren't going to be solved overnight, but some innovative people will solve them.

Network issue #1: I do not think guaranteed Quality of Service for individual video streams will be an issue. Video bits will be delivered in a timely fashion through a future magical fix, but I can't see how Joe Surfin' SixPack is going to pay for additional services to "guarantee" QoS for video watching; videoconferencing perhaps, but not for a mass media service. Current QoS schemes just aren't going to scale for large numbers of people.

Network issue #2: IP multicast will play a limited but important role in delivering streaming media over the Internet. IP multicast will be the technology to distribute large numbers of streams of audio and video across an ISP's POPs or large backbone. IP multicast will not be a widely accepted transport mechanism between ISPs for two simple reasons - politics and network management.

Take a look, a hard look at the current "cooperation" going on with peering, both currently and the ugly, ugly history behind peering. The simple exchange of packets without any fancy priorities or quality of service tags assigned has probably generated more bad blood than any other issue in the industry. It evolved into a Cold War exercise. If you are big enough, people will respect you, people will peer with you. If you aren't big enough, you look like the puppet of a larger ISP.

Now, add on the fact most large ISPs are now owned by CLECs. Many (most?) telephone companies have had the impractical fantasy in the back of their minds that ISPs would eventually move to a settlements basis. If I'm ISP Interesting Times and I move 100 packets across your network, you move 80 packets across mine, there's a difference of 20 packets that I have to pay you for. Of course, the "We know better" long distance companies that want to implement settlements still don't understand that there's enough trouble building routers that move giga and terabits per second. Not to mention accounting and billing software to track and add up what packets have come from where during any particular day.

I've heard plenty of rumors that people were going to implement IP multicast peering agreements, as far back as in February during the Video on the Net conference. Well, it is July as of this writing, four months have passed, no announcements made. The MBONE has been around for ages, but has it proliferated? No. The most damning evidence that the MBONE or IP

Doug Mohney was employee #10 at DIGEX. He has learned, and forgotten, a lot about help desk support, competitive intelligence, sales and marketing, leasedline service ordering, telco service, and public relations. He makes no pretenses at understanding anything more about the technical side of IP other than being able to get

His writings have been published in LA View, Washington Technology and the Washington Post. Doug receives e-mail at moo @clark.net.

a PPP account

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#### ISPs need to become CLECs to survive

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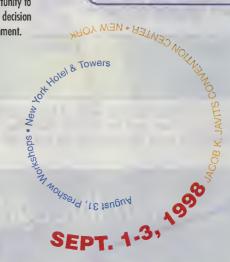
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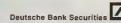
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multicast peering isn't going to happen are that folks like InterVu and broadcast.com are continuing to assemble their own infrastructure. If IP multicast across ISPs were as easy as the well-oiled propaganda machines of certain software companies lead (most) of us to believe, you wouldn't find Internet broadcast backbone providers spending as much money by far.

There's also a high level of discomfort among network operations of allowing anyone to blast large amounts of traffic across their preciously constructed backbones, 24 hours a day, 7 days a week unless it is traffic that they understand and can trust; i.e. traffic they can turn off and on from their console, not from a console controlled by one of their competitors.

At risk of hubris, broadcast systems like SkyCache [blatant warning: The company I work for] will be built and deployed to move around "bulk" data over and around NAPs and the backbones. Streaming video will most likely be delivered directly to the "edge" of the Net via satellite broadcast without ever touching a NAP or a backbone. Once at the POP level, streaming media will be converted into IP multicast form for distribution via whatever "last mile" mechanisms exist.

#### HARDWARE ON THE DESKTOP — DON'T WORRY, BE HAPPY

Progress:Excellent and getting better
every month
Availability:

I have a 200 Mhz Pentium with 24 MB of RAM, MMX I guess, that I bought last year for the low, low price of \$1,495. It's got speakers, it's got a microphone, it's got a 56K modem, it's got

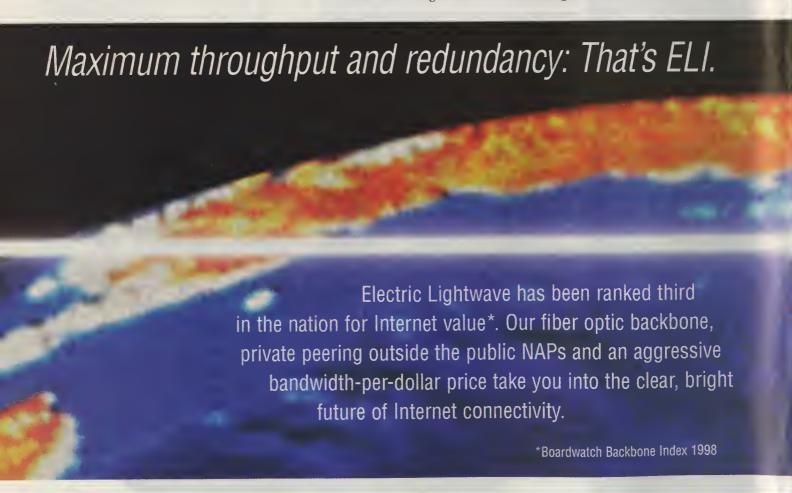
everything. Fast forward to today, skimming through a computer refurb Web site - Dell loaded 400 Mhz Pentium II, 64 MB RAM, some huge hard disk, for the low, low price of \$1,395. By the time you get this, the typical \$2,000-2,500 box will no doubt come with 128 MB of RAM, an on-board 10/100 Ethernet connection, and a boatload of other features.

AMD and Cyrix will continue to keep the price pressure on Intel for the next 6-12 months, with faster chips, better integrated I/O, and dedicated space for faster graphics manipulation. The under \$1,000 barrier has been broken and the under \$500 barrier will probably be broken within the next 12 months, if not by the end of the calendar year.

The only wrench into the works is Intel's misguided policy of offering Pentium II "minus" chips such as the Celestri, that cut features off the baseline Pentium II design in exchange for lower manufacturing costs. It's confusing as hell to consumers, it's fragmenting the marketplace as to what Intel CPUs should be in the PC desktop marketplace. People are going to flock to AMD and Cyrix chips because these companies can make CPUs that kick the hell out of a similarly clocked "real" Pentium at a cheaper price.

Laptop progress is slower, mostly held up by the expense of high-performance/low-power CPUs from Intel, but as of this writing, the price points on laptops is starting to soften.

Look for proliferation on both laptops and desktops of Universal Serial Bus. It's not the perfect solution, but Compaq has a low-cost desktop video camera solution using USB. Higher-end machines, the things at the \$2,500ish price point, should start carrying high-speed FireWire within the next 12 months for no other reason than that they're running out of cool goodies to throw into high end boxes.



Support for higher-speed/more-capable graphics support in hardware will continue to advance, but your guess as to what it looks like over the next year is as good as mine.

No, I haven't talked about the Macintosh. The Apple cultists will be offended, but any change for Apple to have a decent footprint within the desktop market was shot to hell when Steven Jobs killed the Apple clone business by pulling the plug on Power Computing. Nobody has ever won over the long-term with a closed system architecture.

#### SOFTWARE - THE LONG MARCH

Software development is evil. Anyone who tells you otherwise is lying through his teeth or has never written a piece of code worth buying. Windows 98 is out the door and incorporates native streaming audio and video support, including NetShow, RealAudio, RealVideo, and VDONet players. No fuss, no muss, no plug-ins: Just point, click and go. Real's G2 is a pretty good step forward as a plug-in video tool with built-in automagic code updates.

Codec development continues to improve and I've heard some very promising comments about MPEG-4 developing into a robust and flexible standard for delivery of multimedia content. IP multicast acceptance creeps along. Support is embedded in







routers, clients, and server software, but the process of flipping everything on in everyone's hardware is an ISP by ISP battle.

The only potential step backwards that could occur is some sort of major faux pas by Microsoft to do something insane like trying to cram Windows NT onto consumer desktops just because they can.

#### BANDWIDTH — LIGHT AT THE END OF THE TUNNEL?

Progress: Slower than expected
Availability: Cable modems, slowly
increasing. xDSL,
more "trials"
Limiting factors: Money, politics

Cable modems were supposed to take the world by storm - in 1994. And 1995. Finally in 1996, @Home became the first entity dedicated to making cable modem technology work, followed in short order by Time-Warner's Road Runner project. In the shadow of these larger, better publicized projects, smaller cable franchises have been conducting guerilla war, plowing large capital budgets into their backyards. These projects are either two-way or one-way with a dial-up modem back channel, typically in towns or regions of 50,000 people or less. Between @Home, Road Runner, and the many small-scale off-the-radar projects, 1999 may finally work out to be the year of the cable modem.

On the other hand, the problem with DSL schemes is that there are SO many of them. ADSL, HDSL, VDSL, Nortel's Megabit modem scheme, and the list goes on. Compaq, Intel, and Microsoft thought they could dictate a standard for the marketplace, but they grotesquely under estimated the massive inertial forces of the RBOCs. Meanwhile, the RBOCs have tried to pick a stan-

## ISPs: LOOKING FOR A REMOTE ACCESS SERVER THAT IS FASTER, MORE RELIABLE, & LESS EXPENSIVE?

Look no further! Computone's IntelliServer *PowerRack* is exactly that! In comparison to Livingston's Portmaster, the PowerRack has a per port capacity of *921.6Kbps* (Portmaster -- 115.2Kbps), the PowerRack can support *16-64 PPP lines* (Portmaster -- 10-30), the PowerRack's average price per port is \$60 for 64 ports (Portmaster -- \$97 for 30 ports), and the PowerRack has a *5-year warranty* (Portmaster -- 1 year), FREE lifetime technical support and software upgrades, and a 30-Day evaluation option.

The PowerRack also has the standard feature list: dial-in/dial-out access, a powerful RISC CPU, Ethernet connectors, ISDN capability, PPP, SLIP, CSLIP, bootp, rlogin, telnet, reverse telnet, PAP/CHAP authentication, RADIUS II, RIP II, SNMP MIB II, subnet routing, IPCP DNS exts. for Windows 95, and IP filtering.

PowerRack user and Internet Service Provider Michael Behrens, of InterNet Kingston (mbehrens@kingston.net), commented, "The PowerRack is an attractive product, both in its ability to do the job well and to do the job... cost effectively. Port for port costs are significantly lower than the Livingston Portmaster. The product lives up to its name... performance under load is exceptional! The PowerRack also offers a significant feature for feature comparison against the available competition (i.e. Livingston Portmaster). And, technical support was extremely knowledgeable and responsive."





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dard for DSL deployment for their service offerings while some have been obstructionist in allowing third-parties to use existing infrastructure to deliver DSL in a quick and timely fashion.

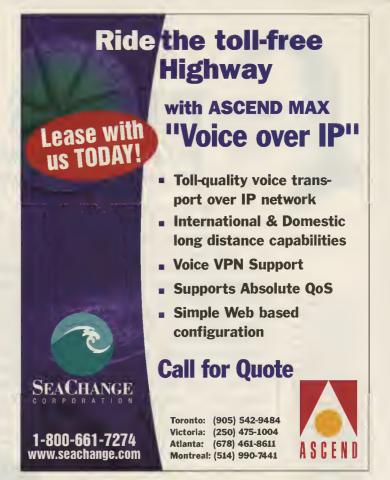
Even when RBOCs have made a press release commitment to DSL deployment, a policy of cherry-picking the well-heeled neighborhoods over a universal service offering seems to be the norm. One RBOC had the audacity to suggest ordering ISDN if one's neighborhood didn't have a DSL service offering available.

Regardless, several Tier 1 ISPs, in conjunction with their CLEC parents, will be aggressively deploying DSL services by the end of 1998. In some ways, this extended deployment of technology is going to make things harder for the content provider since he'll want to use one set of presentation techniques for the "legacy" 33/56K modem crowd, another set for ISDN watchers, and a third set for the high-speed/high-heeled xDSL/cable modem community.

One point worth noting: Advertisers will probably pay dearly for content directed at high-speed/high-heeled viewers. If you can afford the money for a xDSL or cable modem, you probably have money to burn on other consumer goods.

#### **NEXT MONTH — CONTENT**

What are people going to watch? What will people watch? Does the online delivery of a child harbinger "The Birthing Channel?" A look at the future, statements on what is working TODAY, and the reason why streaming video companies are going to be the next-generation "Portal" plays on Wall Street. ◆





### TRONEWS Richard Baguley

#### MCI & WORLDCOM MERGER GETS EU GO AHEAD, WITH CONDITIONS

The merger deal between the telco giants MCI and WorldCom has been given approval by the European Union, under condition that MCI sells of its entire Internet business to UK-based Cable & Wireless. As I detailed in last month's column, the merger had been announced several months ago, but the European Union (EU) had objected on the grounds that the combined company would have a strong enough grasp on the European Internet market to effectively create a monopoly. However, EU commissioners and the U.S. Justice Department have now given their approval to the deal, with one condition - one of the companies has to sell its Internet business. For those of you with nothing better to do, the announcement is at the easily remembered location of http://europa.eu.int /rapid/start/cgi/guesten.ksh?p\_action.get

txt=gt&doc=IP/98/639|0|RAPID &lg=EN, and contains one of the worst pieces of jargon I've ever seen - "Network externalities' (i.e. the phenomenon whereby the attraction of a network to its customers is a function of the number of other customers connected to the same network)."

Not surprisingly, MCI is the one that's going to be selling off its data network. Surprisingly, MCI has announced a

deal with the UK-based telco Cable & Wireless, who had previously been involved in legal action with MCI over a another deal. The background is far too complex to go into here (as we journalists say when we are afraid to admit we don't understand half the legal toing and froing that has been going on), but the final deal is said to be worth around \$1.75 billion and includes all of MCI's Internet backbone operations, both in the U.S. and abroad. About a thousand MCI employees will be transferred to Cable & Wireless, and the company immediately becomes one of the big players on the Internet scene without actually having to do anything itself (apart from handing over \$1.75 billion, of course). Meanwhile, WorldCom gets to hang onto its highly profitable (and very widespread) UUNET subsidiary, with its significant market share both in the UK and Europe. While the combined company isn't quite as strong a force in Europe as MCI and WorldCom had hoped, they are still a force to be reckoned with.

#### SERVICE PROVIDERS LAUNCH CHALLENGE TO NEW BT SERVICE

Last issue I mentioned a new service from British Telecom (who, despite deregulation, still supply the

majority of telephone lines in the UK) called "BT Click," where users could get access on a pence per minute basis which would be charged through their phone bills. Unsurprisingly, many ISPs aren't happy about this, as it's a tough thing to compete against why should customers pay setup fees and monthly charges when they can simply pay for access per minute on their phone bills?

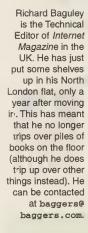
Now, one of the UK ISP industry bodies has decided to stick its oar in by complaining about the service to OFTEL, the UK government telecom industry regulator. The body making the complaint is the ISPA (The Internet Service Providers Association, at www.ispa .org.uk), a non-profit body set up by a number of ISPs to act as a lobbying and advisory body for the industry. In a letter to David Edmonds, director general of

> OFTEL, the organization claims that the "ISPA is very concerned that there may be hidden cross-subsidies distorting fair competition, allowing a dominant telecoms operator to damage independent service providers irreparably. If so, urgent action is needed before it becomes too late for any meaningful redress." Basically, the ISPA is worried that a huge company like BT has enough financial and marketing resources to squash all but the largest ISPs like a

bug. Despite the deregulation of the UK and European telecom markets, BT is still restricted as to what it can and can't do by a number of rules set up after it was privatized to ensure fair competition. Basically, these rules stop BT using profits from one area of its business to subsidize others. Many parts of BT (such as BT Internet) are effectively run as separate companies within BT to stop this from happening.

Strangely enough, the ISPA has also chosen to attack BT Click on technical grounds - a press release claims that the ISPA is concerned that "inexperienced Internet users, who had difficulty configuring their connection using BT's new service, might be put off the Internet. If potential Internet users are not properly assisted in their efforts to get on-line, this could slow down the development of on-line commercial activity in the UK." Now having sampled the appalling technical support offered by many UK ISPs, I think that claiming that only they are fit and able to teach new users how to get online is rather ironic.

The ISPA does raise some other important technical points, though. The BT Click service won't require any username or password - users will simply dial a



special number from any BT phone line. This could be rather a problem from the security and spam angles - a system where hackers or spammers could effectively access the Internet anonymously isn't a pleasant thought. BT hasn't yet answered the question of how it intends to police the service and clamp down on people abusing it. Presumably, BT will be using the trial of the service in Northern Ireland to look at how it can do this and how people will use it.

Bizarrely enough one of the members of the ISPA is BT Internet, the subsidiary of BT that supplies Internet access, although it doesn't bill customers through the telephone bill. However, neither BT Internet or BT itself have yet responded in public to the letter, although they will no doubt be discussing its contents with OFTEL. So far OFTEL hasn't responded either, although it sees unlikely that BT would announce a service like this without first discussing it with them. Will the complaints sway OFTEL? It seems unlikely, but I'll keep you posted.

#### TELCOS OFFER (SORT OF) FREE INTERNET ACCESS



In an increasingly tough market (especially with the likes of BT wading in), many telcos and ISPs are looking for new angles to sell their services. The latest of

these is Telinco (at www.telinco.co .uk), a UK based telecom company that offers international calling services and Internet access. Its latest marketing effort is based around the idea of free Internet access - well, sort of. The idea is that if you sign up with Telinco and spend more than £35 (around \$20) quarterly on its telephone services, the company will give you free Internet access (apart from the cost of the phone call to connect to the Internet). This will probably be only the first of a number of new services and marketing angles of this type - an increasing number of ISPs are applying for (and being granted) telco licenses, which allow them to sell a variety of telecom services. Whatever else happens, it seems that the era of the company who sell Internet access alone may well be drawing to a close.

#### FORMER KGB PLAN TOTAL INTERNET TAP

Meanwhile in Russia, a Russian Internet consultant is claiming that the FSB

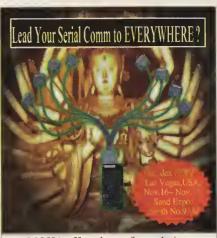
(the new name for the KGB) is planning a system that could allow it to monitor every bit of Internet traffic in Russia. The project (code named *SORM*) would allow the security forces to view every bit of data sent or received by people using the Internet in Russia. The plan calls for every ISP to install a "black box" on its network, which the security forces could then use to monitor all traffic passing through the network. The FSB is apparently very serious about this - it has already been in discussion with a number of ISPs and industry bodies about how the system would work.

The big difference between this and many other systems proposed throughout Europe (such as the Dutch law I mentioned a few months ago) is that the security forces don't have to connect into the network themselves. The proposal calls for each ISP to provide a link between the black box and the offices of the security services. This link would have to be the same speed as the links supplied to customers, so if a Russian ISP sells a 4 Mb link to a customer, the link to the security services has to be at least 4 Mb as well. Unsurprisingly, Russian ISPs aren't particularly keen on the idea.

In theory, the FSB would have to get a court order before they could start tapping Internet traffic, but the black box would mean that the FSB could turn the taps on and off at will. Given its past history, few people think that the FSB would be likely to stick to the law. Check out the SORM Web site at: www.fe.msk.ru/libertarium/sorm/sormdocengl.html.

#### TAKEN TO COURT FOR CRITICIZING THE POLICE ONLINE

Speaking of criticizing the security forces, perhaps it's worth sparing a thought for people who don't have that option, or can expect to end up in court if they do. According to press reports, an 18-year-old by the name of Emre Ersoz in Turkey has just been given a 10month suspended sentence for "publicly insulting state security forces." The sentence was suspended for five years. Although the exact comments that he made weren't revealed, they were thought to refer to the treatment of a group of blind people by the security forces. The people were protesting the number of potholes in the pavement of Ankara, the capital of Turkey. The protestors allegedly receive rough treatment from the security forces. •



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### EYE on E-MAIL by Eric Allman

#### BOND. JAMES BOND.

E-mail is normally person-to-person. But it need not be so. It's not unusual for programs to send e-mail; for example, many batch processes such as line printer and FAX daemons can be configured to send e-mail to inform you when your job has been completed. But programs (agents) can also do work automatically on receipt of e-mail, not unlike the way a Web page can be generated automatically using a CGI script rather than static HTML. Perhaps the most obvious example is the vacation program, which sends a response (nominally "I am on vacation") upon receipt of a message. But far more complex behavior is possible.

Another type of program in this class is list managers such as Majordomo. These programs take commands in the body of a message and perform operations such as "subscribe me to a mailing list," on behalf of the sending user. This is more complex than the vacation program because it has to parse the body of the message; the vacation program only has to look at the message envelope to do its job.

**CREATING A NEW AGENT** 

Agents are programs that are invoked when mail is received. They might be invoked via a program call in a .forward file or a user procmail script, in which case they are tied directly to the existence of a particular user (and will be invoked with the permissions of that user). This is the usual case with the vacation program, for example. Alternatively, they might be invoked from a system alias, which is not tied to a particular system user, as would be the case with Majordomo. Since these are not associated with a particular user, they will be invoked as a system-wide user id. To get around this, such programs often use the setuser-id feature so that they can update databases without making them world writable. The first step is to figure out which type of invocation your agent will use.

Agents that only look at the envelope are limited in what they can do. In general, about all they can do is return a message to the sender. However, this is a useful class of application, including the vacation program and other auto-responders. For example, mail to info@Sendmail.COM has an auto-responder that returns a message acknowledging receipt of the mail; copies are also archived and delivered to an individual who determines what further action is required.

However, most agents do further examination of the message header and/or body. For example, a more interesting auto-responder would read and parse the message body to get the names of files to be returned.

On a UNIX system running sendmail, the agent will be invoked with no special arguments beyond what is listed in the alias or .forward file. The agent will receive the message on standard input, starting with the UNIX message delimiter line (the one that begins with From and followed by a space character). This line contains the envelope sender. Immediately following this envelope line comes the message header, a blank line, and the message body. The whole thing ends at an end-of-file. Thus, if you only want to look at the message body you need to skip everything up to a blank line. Note that normally lines that appear to be message delimiters (that is, lines that begin with "From<space>" or lines containing only a dot) are not escaped in any way; these syntaxes are only special as the first line of the message or in an SMTP transaction respectively. If you are going to combine multiple messages into a single mailbox, you will have to escape or otherwise encode "From<space>" lines.

Care must be taken not to get into trouble when processing a message. For example, if you allow access to named files then someone who guesses how your auto-responder is implemented may be able to read any file on the system. One particularly egregious example of this was when I discovered a "clever" user who had figured out that he could forward his mail to a script that would pass the body of the message to perl for execution; this way he could run arbitrary programs on his workstation from afar. Unfortunately, so could anyone else, and although he never did anything malicious, there was nothing preventing anyone else from sending a less well-behaved program to him and doing some real damage.

Other common problems include agents that overflow buffers, allowing execution of arbitrary machine code at the receiving machine; agents that call other programs using a shell invocation - thus permitting someone to pass a string including a semicolon to execute arbitrary commands; and agents that read or write files without realizing that the invoker might have used a full pathname. In fact, it used to be common for systems to have an alias for uudecode that would invoke the uudecode program which will read a message for an encoded binary, including the location and file mode. Although useful as a "poor man's FTP via e-mail," it was a disaster for system security, since it allowed any remote user to put files anywhere in the system. Note that programming in a high level language such as Perl can eliminate some of these

Eric Allman is the chief technical officer at Sendmail, Inc., a leading e-mail server company based in Emeryville, California. He is also the author of the .i sendmail MTA, the \-me macros. syslog, trek, and a variety of other fun programs. He can be reached at eric@send mail.com.

problems (e.g., string buffer overflows) but make other problems worse (weird characters that need to be escaped).

Agents must also be careful to return a sensible exit status. If they exit with a zero exit status, sendmail believes that they have been correctly processed, logs the message as delivered, and removes it from the queue. Any other exit status indicates a delivery problem. In most cases the original message will be returned to the sender as undeliverable, although if it has the special value EX\_TEMPFAIL (75) the message will be returned to the queue to attempt delivery later.

One approach to avoid havoc on your system is to limit the programs which can be executed as agents. For example, on a sendmail installation you would use the smrsh (sendmail restricted shell) program in the configuration file as a replacement for /bin/sh. This wrapper limits the programs that can be executed to those in a particular directory, nominally /usr/adm/sm.bin. This way the system administrator can prevent users from shooting themselves in the feet. Of course, this increases the administrative overhead, but auditing the available agents is essential to maintaining system security.

#### **FOLLOW THE BOUNCING BALL**



Many years ago I heard an interesting story. It seems that two of the early ARPAnet luminaries had each independently thought up the concept of using an auto-responder to send a notification back to senders to tell them that they were away from their e-mail. Both of them were out of town (by chance at the same meeting) and had set up such an auto-responder. One of them, immediately before he left, sent an mail to the other saying "I'll see you at the meeting." Fortunately, the ARPAnet backbone was only 56 KB, and machines were slower then. Unfortunately, disks were smaller, and disaster occurred as each of their auto-responders diligently sent mail to the other until their disks filled up.

There are a couple of ways of avoiding this sort of problem. The first is to always send machine-generated bounce messages using the special envelope sender address  $\Leftrightarrow$ . This special address tells the other end not to send any reply. Unfortunately, there are still some mailers out there that ignore this request, and in some cases are sufficiently rude as to extract the header sender address for bounces (a clear violation of RFC 821).

The UNIX vacation program solves this problem in another way: it keeps track of who it has sent mail to, and refuses to send mail more often than once every seven days. If the message has been sent to you within the last week, vacation acts as a no-op. Unless your networks are very slow, this acts as a very effective loop breaker. If your networks are slow, at least you aren't getting "mail bombed" with messages.

In general, auto-responders shouldn't reply using a sender address that is the same as the address that generates the response in the first place. If they do, they should be sure to keep a tracking database to break loops.

#### AND FOR MY NEXT TRICK

E-mail based agents have been pretty weak for most of their history. This is largely due to the relatively low ability of Mail User Agents to express complex data. Most of them take the position that mail is text (which isn't surprising, since it is). But that is starting to change.

The Multipurpose Internet Mail Extensions (MIME) standards (RFCs 2045 through 2049) are an attempt to provide increased semantic richness for e-mail messages. Although they were originally designed for fairly static type extensions (e.g., including an image/jpeg picture in a mail message), the mechanism is extensible and can be used to provide semantic depth. For example, you can imagine a message that is sent to you which, when read, puts up a form on the screen inviting you to fill in the blanks and click a "submit" button. Hmmm... sounds a lot like HTML, doesn't it? And in fact, Netscape's preferred solution is to send e-mail structured as HTML.

Actually, Web pages are returned from Web servers to browsers as MIME messages: they have a header that looks a great deal like an e-mail header, including MIME-Version: and Content-Type: headers. So the semantic difference between the Web and e-mail isn't as great as you might at first suspect. This is the way the standards-based approach tends to work: standards build on each other, which is one of the reasons that it is generally cheaper to run a mail system based on standards than to run a proprietary mail system.

However, there is pressure to go with proprietary mail systems, which integrate features such as calendar systems that require richer (generally interactive) semantics. These features can be useful, but (unsurprisingly) don't interact well outside of an organization. I believe that market pressures will cause a movement toward standards-based approaches. Essentially, a MIME type to encode and exchange calendar information will be promulgated and documented. This will be followed by implementations of that proposed standard. As it gains acceptance, it will become an ad hoc standard, and later be incorporated into the standards bodies. That will take a while, but the full light of examination will improve the standard for everyone.

It's interesting to note that enhanced semantics will require agents to do the processing. If someone wants to find out if you are free for a meeting at a particular time, they (or rather, their MUA) will send mail in a defined format to a particular address to pre-reserve the time if available and return that information. A mail response will go back, again in a defined format, acknowledging that the requested time is available. Finally, a third message is returned either reserving the time or freeing it. This is nothing more than the three phase commit used in distributed database systems. In fact, this is nothing more than a distributed database system using e-mail as the transaction backbone; when seen this way, the full power of the method begins to become clear. ◆



### THE ISP CLUB by Greg Tally

#### LET'S BUILD BETTER ALLIANCES BY SWAPPING NOTES

Let's organize, let's unite, as folk singer Woody Guthrie might say. To better represent their businesses, Internet service providers around the world have come together to form industry alliances. But what all these groups are up to, exactly what they do, nobody has ever really looked into before.

A former assistant editor with The Business Times of Western Colorado, cub reporter Greg Tally spends his days trying not to call Managing Editor Bill McCarthy "Chief"and dodging various projectiles hurled from the general vicinity of McCarthy's office. Greg can be reached for comments or general excoriation at greg.tally@

boardwatch.com.

Of course, that last statement is like saying Columbus discovered America; you have to discount the Vikings, Native Americans and possibly one very misguided Irish monk to make the idea stick. But Columbus was the guy who made enough noise to get everyone's attention, so he got the credit in the history books. That's one purpose of this column: to make enough noise about ISP associations to see who sits up and takes notice.

By my very informal first count, there are roughly 16 ISP groups in North America, nine of which cover a specific region, state or province. The other seven organizations comprise broader national industry alliances. Overseas, there are about 20 ISP groups, including the 10-member countries of the Euro-Internet Service Provider Association.

Throw into the pot Internet operations groups like Réseaux IP Européens (RIPE), the North American Network Operator's Group (NANOG) and the Asia Pacific Networking Group, as well as Internet governance and policy groups like Electronic Frontier Australia and international standards bodies like the IETF, and there's quite a lot of organizational goings-on to be covered.

Within the U.S. and Canada, there's a growing need for the national media to report on local-level dust-ups in state courts and legislatures, city councils and school districts. The power these governing bodies exert over ISPs on their home turf can be enormous. And like any savvy industry group, ISPs are tired of being pushed around, or at least pushed around without having their say.

And apparently the interest is there. "All I can say is 'IT'S ABOUT TIME' *Boardwatch* did this...," wrote Gary Gardener, the executive director of the Washington Association of Internet Service Providers (www.waisp.org), to my initial e-mail query.

A more open dialog between ISP groups at home and abroad could help organizations join forces to apply pressure or affect change when it's needed. This tactic works for human rights organizations, unions and other trade alliances. There's no reason why it couldn't work for ISPs. This column will act as a tactical clearing house for this information, helping groups

coordinate and better protect their constituencies. How an ISP group in say, Germany, responds to a Bundesrepublik court case or EU regulation could have practical applications to an ISP fighting similar battles in Georgia or Green Bay, Wisconsin. The very nature of the Internet could mean organizations are fighting the same battle on BOTH fronts, such as a stateside Web hoster combating a scandalized and censorious foreign courtroom.

Of course, this also begs the question of whether or not particular groups are effectively addressing the needs of ISPs in their region. Not all organizations are created equal, or run by pragmatic, competent people. Membership rolls can be inflated; an organization's impact can be exaggerated with sleek logos, Web pages and press releases. The folks running ISPs tend to be cynical, hard nosed empiricists. They respond to results and approach life from the Cuba Gooding, Jr. school of "show me the money." There's a need for a consumer watchdog to both aid and monitor these ISP associations. Flipping over a few rocks to grub out the sham groups and dope slapping them as needed — as well as rewarding the solid types who are industry leaders - should shed some light on the situation. (Texas and Florida have the reputation of having extremely strong ISP organizations). At the very least, I can keep some of the moon-eyed brethren who thought it would be neato to form an ISP club from wasting our time. After all, you folks got businesses to run.

#### **NORTH AMERICA**

If Bill Catlan has his way, he will organize smaller ISPs into a commercial force with the same clout as the Associated Press, Ace Hardware and Ocean Spray. All of these household names are cooperative associations. Catlan says a co-op would allow regional ISPs to pool their resources into a national, tax deductible enterprise.

Called the Cooperative Internet Service Provider Consortium (CISPC), Catlan says his group would let, "local and regional ISPs...develop projects, which they believe are worthwhile, but might not otherwise be economically feasible."

Among Catlan's ideas for an ISP co-op: operating a national distribution center for equipment and supplies purchased by ISPs, designing a plan to provide national roaming service to customers, producing a national referral service and marketing campaign, sharing the costs for building a national backbone and sponsoring research and development for the emerging class of business services. The gist of it is to grow rich together with mutual benefits for members.

So far, Catlan's idea is still only a glimmer in his eyes. There is only one ISP member, Frank Marsolais of Benchmark Communications, and no executive board. By his own acknowledgment, Catlan is pretty much it. No one else has currently ponied up the \$300 to join. (In the interest of full disclosure, Catlan hopes to drum up interest and support among ISPs at the fall ISPCON in San Jose, California. He is an accepted speaker).

It doesn't hurt to hear this guy out, to at least check out his Web page (www.cooperativeisp.org). Internet businesses team up every day to share assets; competitors supply access to their individual networks in the interest of interconnectivity. But perhaps the merit of Catlan's ideas lies in the possible corporate structure of his organization. Depending on the state, incorporating as a co-op could have business advantages. Capital investment by any one player could be limited by law, thus decreasing the liability for larger projects.

Catlan is leaving the specific designation of the cooperative up to founding members. A producer-owned co-op such as the kind run by farmers or retailers might allow members to provide themselves with combined marketing and supplies. A worker-owned cooperative could produce similar business advantages. I know of at least two regional ISP groups already using the co-op structure: the Colorado Internet Cooperative Association (www.coop.net) and the Michigan Internet Communication Association (www.mica.net). I'm sure if I sniffed around some more, I would uncover others.

For more information on co-ops as a business structure, contact the National Cooperative Business Association (www ncba.org).

#### **EUROPE**

EuroISPA has picked its Austrian representative Georg Hahn to be its new president. Hahn is currently the chief technical officer for Internet applications at Netway AG, based in Vienna. EuroISPA is a European federation of national ISP associations that represent over 500 ISPs across the continent (www.euroispa.org). EuroISPA's presidency system copies the European Union's own rotation of presidents. Each member state serves for six months.

Meanwhile, the UK-branch of ISPA (www.ispa.org.uk) has its hands full protesting a new service offered by one

of the country's biggest communications companies, British Telecom (BT). ISPA describes BT's plans to offer instant Internet access for 1 pence a minute as anti-competitive.

BT's new service is called Click, and aimed at inexperienced first time users. In a letter of protest to the Office of Telecommunications (Oftel), Britain's regulatory equivalent of the FCC, ISPA expressed concern that Click would sour new users to the Internet altogether. ISPA describes the Click service as difficult to configure.

The organization also worries that BT's service could reduce competition in the Internet market.

"ISPA is very concerned that there may be hidden cross-subsidies distorting fair competition, allowing a dominant telecom operator to damage independent service providers irreparably," said Chief Executive David Kennedy.

At the time we went to press, British Telecom was unavailable for comment.

The ISPA was founded in February 1995 to represent the business interests of European ISPs. ◆



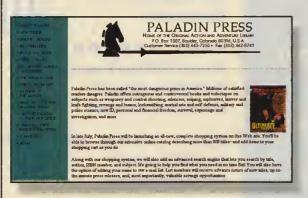
## Notes From The Underground by Wallace Wang NEW BOOKS TO KEEP HACKERS HAPPY AND BUSY The book industry loves computer hackers. tronic equivalent of a Colt Python .357 under the

Starting with Bill Landreth's Out of the Inner Circle and continuing with titles like Secrets of a Super Hacker and Forbidden Secrets of the Legion of Doom Hackers, publishers love the sensationalism that surrounds hackers and feeds the small but growing market of curiosity seekers.

While hacker books tend to go out of date fairly rapidly, they still provide an amusing source of information and historical perspective to the hacker community. Because publishers have to walk a tightrope between providing useful information and avoiding lawsuits, most hacker books focus on generalities rather than specific techniques that would be obsolete by the time they appeared in print anyway. If you want to learn to hack into a DEC VMS operating system or take down a Wildcat 4.01 bulletin board system, you're better off browsing through hacker Web sites or chat rooms and exchanging information with others. But if you just want a general knowledge about hacking techniques, you might enjoy the latest batch of hacker books to appear in print.

THE ULTIMATE INTERNET TERRORIST

Paladin Press (www.paladin-press.com), a publisher better known for selling survivalist guides and handbooks for perfecting military-style sniper techniques, has released a slim paperback dubbed *The Ultimate Internet Terrorist*.



True to the style of most Paladin Press books, *The Ultimate Internet Terrorist* provides decent information peppered with alarmist overtones. The back cover of the book claims that "Reading it (The Ultimate Internet Terrorist) won't make you bulletproof, but at least you'll know which neighborhoods to drive through with the windows up and the doors locked. You'll know the right things to say to the hostile natives to keep from getting wasted online. In some cases, you'll even have the elec-

tronic equivalent of a Colt Python .357 under the driver's seat - just in case."

The Ultimate Internet Terrorist covers e-mail bombing and forging e-mail addresses, electronic stalking, chat room dangers, cybergangs, and computer viruses and Trojan Horses — using fear exclusively as its major selling point. If this were the only book you read about the Internet, you might become paranoid that everyone on the Internet is trying to steal your credit cards, track down your bank account numbers, and wreck your computer with deadly viruses that can melt your hard drive into oblivion.

By focusing exclusively on the negative side of the Internet with exaggerated alarm, The *Ultimate Internet Terrorist* makes for interesting reading but skips over the facts that might dampen its "the Internet is crawling with criminals just waiting to pounce and make you their next victim" attitude. If you're looking for a balanced perspective, you won't find it in this book.

The chapter warning readers about the dangers of computer viruses is especially amusing (and technically inaccurate). The author practically screams at you, "There are even — I swear upon my ex-chemistry professor's name — 'build-a-virus' kits and software 'labs' available as hackware bundles...These allow the more socially deviant among us to play 'Dr. Moreau' and find something that will eventually kill every computer on the planet someday. Virii are fickle little sons-a-bitches; they sometimes have immediate consequences, e.g., your files are destroyed and the disk is wiped clean, or they may be — Jesus Christ save us all — time-released for days, weeks, or months."

Of course the reality is a little less glamorous. Most virus toolkits have bugs that prevent them from working correctly, thus they tend to crank out sterile or dead-on-arrival viruses. Using a virus toolkit requires a bit of technical knowledge as well, so the odds of a beginner cranking out killer viruses with a virus toolkit is about the same as a beginner building a house while using a table saw for the first time.

The technical inaccuracy of the chapter flies off the page later when the book claims, "Even a magnetic erasing (a tape-eraser, in other words) of the infected medium carrier is not safe! The hell of it is you can never be certain the virus is 'gone.' It's embedded in the disk microscopically."

How any computer program could embed itself microscopically in a hard or floppy disk is beyond my under-

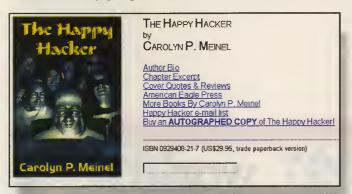
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When not working with computers, he performs stand-up comedy and has appeared on A&E's Evening at the Improv TV comedy show. He can be reached via e-mail at 70334.3672 @compuserve.com, bothekat@aol.com bo\_the\_cat@ msn.com, or bothecat @prodigy.net standing. This wildly alarmist and totally false statement places suspicion on the rest of the book's accuracy as well.

Still, if you read *The Ultimate Internet Terrorist* with a healthy dose of skepticism, you will find useful and interesting information about how others might harass you or make your life miserable using a computer. But believing that *The Ultimate Internet Terrorist* realistically explains the dangers of the Internet is like believing the movie "War Games" accurately revealed that a teenage hacker could really start World War III from a home computer.

#### THE HAPPY HACKER

The Happy Hacker (published by American Eagle Publications, P.O. Box 1507, Show Low, AZ 85902) is a bit more down to earth while providing step-by-step instructions for performing specific tasks such as editing the Windows Registry or circumventing password protection on Windows 95. Much of the information from the book originated from the author's Happy Hacker Web site (www.happyhacker.org). For a raw beginner, The Happy Hacker provides the same illusion of reality as a summer baseball fantasy camp might provide an out of shape baseball enthusiast; you get to pretend to be a hacker without really going through all the hard work.



While experienced hackers may shun the book (especially because the author has been responsible for shutting down several hacker Web sites), novices may find the book interesting and informative. Particularly useful are the chapters covering port surfing, mapping the Internet, and fighting back against spammers.

Fortunately, The Happy Hacker avoids the panic-stricken, alarmist tones of The Ultimate Internet Terrorist. But unlike other hacker books (such as Secrets of a Super Hacker), the many screen and code listings in The Happy Hacker might intimidate someone unfamiliar with command-line interfaces and C source code listings. If you're interested in a more technical discussion of hacking than any other book on the market, The Happy Hacker is probably your only choice on the market.

#### THE GIANT BLACK BOOK OF COMPUTER VIRUSES

Besides publishing *The Happy Hacker*, American Eagle Publications has recently published its second edition of *The Giant Black Book of Computer Viruses*, which provides actual source code examples for creating your very own computer viruses.

The book starts by dissecting a simple virus, which can infect the nearly extinct .COM files that used to be so prevalent around older MS-DOS systems. Once you understand the basics of virus writing, the book advances to more sophisticated topics such as infecting .EXE files (which are a bit more complicated than .COM files), infecting boot sectors, writing macro viruses, writing 32-bit Windows viruses, and creating retaliating viruses that actively attack anti-virus programs.

Novices are unlikely to find this information useful for cranking out killer viruses, but assembly language, C, and Visual Basic for Applications programmers will be able to use the skeleton source code provided by the book to create rudimentary viruses. With a little practice, a skilled programmer could definitely use this book as a giant stepping stone to writing the next batch of killer computer viruses.

Despite the anger of the anti-virus industry that wants to prevent virus-writing books such as *The Giant Black Book of Computer Viruses* from ever being printed in the first place, this book provides honest technical discussions of computer viruses without judgment. While readers could use the book's information to write destructive viruses, they can also use this same information to educate themselves and others about how viruses really work. That way they can better understand and dispel the many myths of computer viruses (such as the erroneous belief that a computer virus can microscopically infect a hard disk).

#### STEAL THIS COMPUTER BOOK

No Starch Press (www.nostarch.com) has been kind enough to publish this book, which is a compilation of previously published "Notes From the Underground" columns taken from this magazine that have been updated and rewritten.



If you've been reading this column regularly, you'll have read at least half of the book already. But if you're new to this column, then *Steal This Computer Book* can help you with information about online harassment programs like AOHell, finding and avoiding scams on the Internet, reading foreign newspapers and magazines to get a more balanced perspective on the world, using specialized search engines that only find X-rated or hacker Web sites, and tracking down people on the Internet.

While none of these books provide cookbook recipes for turning a novice into a battle-hardened hacker, they can be useful for learning about the latest problems surrounding the Internet and how to protect yourself while going online.

Despite all the glamorous television commercials and magazine ads, the Internet is definitely not just a fun place where

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kids innocently send e-mail to their grandparents and families solve problems by downloading the latest quotes from the stock market. Like any big city, the Internet provides its share of wholesome family entertainment along with seedy pornography and various inducements to crime.

Reading one of the latest hacker books on the market can show you the less publicized uses for the Internet, but remember that the criminal element on the Internet is no greater than the criminal element working the streets in your own neighborhoods. Taken as a whole, the basic message of hacker books is that you should be wary of being robbed or hurt through an online excursion, but with a little bit of precaution, you can avoid becoming the Internet's next victim. ◆

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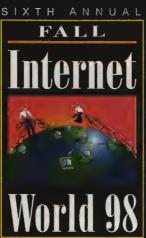


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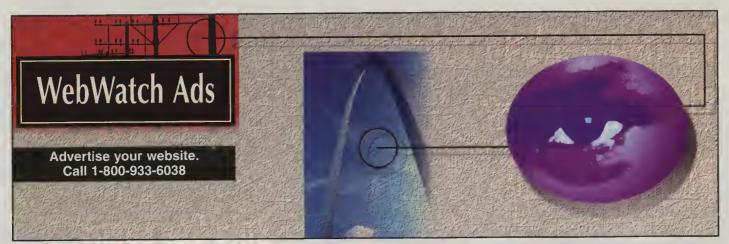
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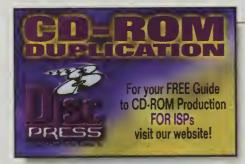
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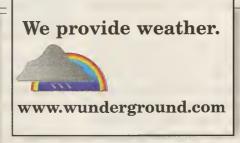
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### DVORAK ONLINE by John C. Dvorak

#### COMMUNICATING SMALL - ANOTHER ODE TO THE PALM COMPUTING PLATFORM

DISCLAIMER: I'm warning you before you read this column that I'm a huge fan of the Palm Pilot platform. I know many of you are used to me being 100-percent critical. If that's what you expect ... then run! RUN!

In the next few months the Palm Pilot will begin to Lshow up in various licensed forms. I recently saw one with a scanning laser attached to the head of it so it could do on-the-fly bar code reading. I assume this will be used for inventory or whatever. I can see a lot of uses for a Palm Pilot that can read bar codes like this. Someone has also incorporated a pager into a Palm Pilot so messages can be displayed in detail. I'm told that a version of this device will appear that will incorporate an antenna and radio modem. It's obvious that this thing will be a mobile communication dynamo in the next few years. More importantly this machine will eventually become the replacement for the desktop computer when people finally get sick of these dinosaurs we have on the desktop today. It's this aspect of the Pocket computer that we have to be ready for.

I don't really need a big clunker the size of today's tower computer. The sudden popularity of all-in-one el cheapo machines such as the sub-\$1,000 machines is part of a backlash against the behemoths. When desktop computing first began, the machines weren't as big as these clunkers we are being sold today. Take the SOL-20 (please!), circa 1977. Here was a keyboard computer with everything built-in and with room for expansion slots. Add an attached disk drive and you had a complete system in a fourth the size of today's machine. Steve Jobs actually has the right idea with the i-Mac, compact and classy.

But what if you could put an entire computer system into the Palm Pilot case? This unit would drop into a cradle (which people are already being trained to use) into which a keyboard, monitor and mouse would be attached. Hooked into the net, this is the future of computing. When this pocket PC was jerked out of the cradle it would function differently taking into account the character recognition and smaller screen. The difference between the small unit unplugged and today's Palm Pilot would be the size and power of the databases. One use will be large portable databases. I'm so convinced that portable databases will be a new category that I've developed one myself to prove a point. It's called Wine Pilot and it's a large database of tasting notes and rankings updated weekly. It loads into the Palm Pilot and you can have a portable database with you when you shop for wine and when you're looking at a restaurant wine list. The kicker is that it's a weekly update and you can update whenever you want for a dollar. I actually designed this for my own use since I was tired of spending a fortune on wine that was mediocre. Go to www.winepilot.com or www.pocketplanet.com to get a copy. (This is the other key to success - the Web.)

While portable databases will trigger more sales for the Palm machines now, what can be added to the device to make it a world-beater? Besides the built-in pager, built in bar code reader and built-in modem. there is a lot to do. Let's start with the fact that there will be an antenna on the device. So why not a radio and TV? It would be hot to watch TV on the Palm computers while at the airport, for example. And the device would use a small jack into which you could plug in headphones. And you may as well use the jack to plug in a phone-set so you could use the device as a cell phone. The antenna could have many uses. You could use your address database to find the number and the small machine could make the call.

The antenna and screen also makes it convenient to turn the machine into perfect GPS device which could be coordinated with the name and address database or a restaurant database.

Finally the machine could also act as a scanner with a simple add-on. It could effortlessly be a camera with any number of super small lenses and CCD's that are available. And there is no reason why it can't also be a verbal note taker with a small microphone attached.

While it seems far-fetched by today's standards that such a do-all machine can be built, most observers think the opposite is true. In fact, I'm told, it can be built now although it would be prohibitively expensive.

The communications angle with such a device is what should interest readers of Boardwatch the most. First of all, it's possible that in the near future this device could be on the Internet 24x7. When I discuss this possibility in my talks I also like to mention how it could also be used to home in on you when the government decides that you should be eliminated! But I digress.

Being on the Net 24x7 with a portable device affect numerous markets. First it affects the structure of the web itself. This device will never have a large screen although I can envision using it with those new gog-

In addition to his weekly syndicated radio call-in show, Software/Hardtalk, syndicated newspaper columns, magazine writing for MacUser, PC Computing, DEC Professional, Information Technology, and his featured "Inside Track" column in PC Magazine, Dvorak is the author of several best-selling books, including Dvorak's Inside Track to DOS & PC Performance. Dvorak's Guide to PC Telecommunications, and Dvorak's Inside Track to the Mac. He maintains a Web site at www.dvorak.org. John can be reached at dvorak@ dvorak.org gles that let you see a virtual 21-inch monitor. With a small form factor that means web pages will have to adapt to this ludicrously small screen. 320x240 maximum resolution comes to mind. Already with WebTV and other low-end access Web designers have to rethink any notion about 800x600 and forget about 1024x768 Web pages. I often wonder about the long-term viability of fancy web designs because of low-end entry onto the net. Of course the sites could auto-sense the Pilot vs. the desktop computer and send specialized pages. But this will somehow have to be automated completely including page generation for people to do it.

And with 24x7 connectivity I have to wonder about the long-term viability of large portable databases when it would be almost as easy to look at these databases over the Web-air-link. Then again 24x7 access on a handheld device actually introduced more problems than it eliminates. It doesn't do you much good in an airplane or even in a metal building since it's difficult to connect in these environments. And, if

you haven't noticed, the kinds of connections you get in stores, for example, tend to be pretty mediocre. Getting a reasonable data rate will be impossible.

I have given these small machines a lot of thought when first introduced to them by a guy who pointed out to me that a Palm Pilot essentially has more power, storage and memory than the SECOND generation Mac, the Mac 512K.

As for the Windows CE vs. Palm Pilot debate, right now the Palm machines are the way to go. There are plenty of sites with lots of software, there are more developers and the machine is simply better. More importantly the Windows CE platform runs in various chips and the application software does not necessarily run on all the machines. No reviewers ever emphasize or even mention the problem. This compatibility dilemma is Microsoft's dirty little secret that will bite them in the butt if the machine shows increased sales. Right now the Palm Pilot and Palm III are the hot tickets.  $\spadesuit$ 

# RECIPE NOOK Sultan's Delight

ne of the big trends in cooking nowadays regards the mixing or fusion of two or more cuisines. Typically it's something like French and Japanese or Italian and Brazilian. One overlooked and fascinating cuisine is the one simply called Middle East cooking. If you can ever find the Tess Mallos Complete Middle East Cookbook (McGraw-Hill, 1979) buy it and go crazy. She covers all the cooking styles from all the countries, and if you can cook at all you'll discover new kinds of fusion that will amaze your friends. If you've ever been to the Middle East and sampled the food there, you know how fabulous and fascinating it can be. This cookbook duplicates it to perfection.

My favorite recipe in the book, Sultan's Delight is highly recommended as a dish to boggle the minds of any dinner guest or even your family. When I want to show off I add this side dish to a meal. One word of caution: Middle East cooking requires more time than most modern recipes. Usually served as a surrounding for a braised lamb dish called Tas Kebap.

#### **Ingredients:**

1 pound of small eggplants 1 TBL lemon juice 1/4 cup butter 1/4 cup flour 3/4 cup milk 1/2 cup soft white breadcrumbs (optional)
1/2 cup grated kasseri cheese
finely chopped parsley
salt
pepper

Grill eggplants over soft flame charcoal or on a hot griddle until softened and slightly charred skins can be easily removed. This can take up to 20 minutes. Remove skin and throw in a blender with the lemon juice to puree the flesh. Cook the flour in the butter to make a light roux. Do not brown the flour but make sure it is thickened and bubbling. Add the eggplant puree and cook slowly for 20 minutes slowly stirring. Add breadcrumbs as necessary to get a firm thick texture. Stir in the cheese and continue to cook until the cheese is incorporated. This final mixture should be something like mashed potatoes in consistency. Salt and pepper to taste. Sprinkle with chopped parsley.

You can also make this with kashkavel or coon cheese although I have only used kasseri, which works to perfection. Kasseri is an odd-tasting semi-hard Greek cheese made from a combination of Goat and Ewe's milk (as are many of the greatest cheeses in the world). These animals live in various delimited areas and feed off vegetation peculiar to those locales. You can find it at most good cheese shops and all Middle Eastern stores. It's distinctive.

You can serve this as a side dish with just about any dish. It's usually served with a rich lamb or chicken dish in the Middle East. But experiment, that is what fusion is all about. Once you do this dish, I guarantee you'll make it part of your regular arsenal. It's a fantastic recipe. ◆

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# An Invitation



# to the Internet Service Provider Convention ISPCON Fall '98



e are most pleased to invite you to the 1998 Internet

Service Provider Convention (ISPCON), September 28-October 1, in San Jose, California. ISPCON has emerged as THE meeting place for Internet service providers and national backbone operators, as well as the technology companies that tool and enable them. Our Fall '98 West Coast event, in the heart of Silicon Valley, already promises to be the largest event we've ever held with over 5,000 Internet service providers, CLECs, RBOCs, cable operators, telecommunications resellers, and an assortment of venture capital firms and media quite beyond anything we've ever organized.

Jack Rickard

And we'd like you to come.

Over the past year, the very definition of Internet service provider has become a bit frayed as satellite companies, local telephone companies, wireless companies, cable television companies, telecommunications resellers, and others have determined that Internet access and packet networks are a "must have" component of any communications product mix. All of telecommunications threatens to evolve toward providing access services to a global packet network known as the Internet. And the resources brought to bear on such problems as bandwidth to the home, connecting small- and medium-size businesses, deploying voice over the IP network, quality of service guarantees, virtual private networks, caching and performance are almost mind boggling to contemplate at this point. Representatives from every major company in every one of these segments are expected at this Fall's ISPCON in San Jose.

As both the technologies and the business models for Internet communications access evolve almost minute by minute in this firestorm, the importance of gaining a rational, informed perspective on what the future holds for us all in Congress, and for each individual business planner and implementer, takes on gargantuan proportions. The slightest edge in intelligence on where and how to participate can literally

mean the difference between life and death for many of these companies - not in 20 years, but in two years.

There is currently no noticeable shortage of Internet-related trade shows. But most are designed to appeal to the mass of Internet users. ISPCON has succeeded as the ONLY trade show designed for Internet service providers the people who make the network run and provide access to those customers. We've encountered such success that virtually all of the larger Internet shows have tried to lay claim to the ISP market with pavilions, special tracks, event stunts, etc., to persuade exhibitors that they have a serious contingent of ISPs attending their shows. But they apparently failed to mention it to the Internet service providers themselves. ISPCON is designed for those serious about providing Internet access either for profit as part of a communications product line, or internally in their companies.

The result is a smaller, more focused show that is NOT particularly open to the general public. If you are not involved in provisioning Internet access services, building national networks, helping companies successfully make the connection or designing the technical and server end of Web hosting/development, you will undoubtedly find ISPCON chaotic, technical, and confusing. In a word - stay home. You'll clutter the action for those faced with the mammoth task of building and extending a network and doing so at a profit for their businesses. This show is for ISPs.

In the past two shows, we have had some notable participation from a second group. We call them "Internal ISPs." These are the technical implementers within medium to large businesses who maintain a connection to a public backbone or service provider and almost immediately wind up providing identical services to various entities within the corporation. We used to say they were ISPs without the billing problem. As it turns out, we were even wrong about the billing problem.

As always, ISPCON is an intensely educational meeting event. We have scheduled over 150

2

educational sessions in both presentation formats and meeting/discussion formats, addressing every aspect of operating an ISP business, a tiny fraction of which can be profiled in this brochure. These sessions cover business topics such as marketing, operational models, and how to value an ISP business. They also deal with inter-ISP operational policy issues such as peering, settlements, caching, QoS, performance measurement, and exchanges.

But many of the sessions do get technical. We had 15 sessions on voice over IP networks at the spring show and actually expect more at the fall event as this area develops. Similarly, we have entire tracks devoted to virtual private networks, caching strategies, QoS, and other newly emerging products and services that alter the access business.

But it also covers and really reflects the ever evolving technologies of delivering Internet access through cable, wireless, satellite, xDSL technologies, and how to find the opportunities in IP telephony. There are even sessions dedicted to ISP exit strategies, mergers, acquisitions, initial public offerings, and how to value an ISP company.

Indeed, the more popular sessions center on finance, capital, and effective business techniques you can use to grow Internet access and service businesses. ISPCON has attracted a significant contingent of venture capital firms, investment bankers, accounting firms, and other service businesses working with service providers.

In an industry fueled by technological change, it comes as no surprise that technology always occupies a central role at ISPCON. Virtually every significant vendor of an Internet product at this point totally comprehends that if it doesn't sell among the Internet service

providers, it doesn't have a chance in the wider world of the Internet body politic. The corollary of course is that if you can capture the attention and enthusiasm of the ISP community, you have entrée into essentially the 60 million customers they, as a group, provide access to. That's incredible leverage through a scant 5,000 players. It may be one of the reasons ISPCON is steadily displacing larger shows as THE place to unveil the latest hardware and software developments in communication technology. This too is a double-edged sword. Some companies have unveiled products at ISPCON to enthusiastic approbation among ISPs and gone on to dizzying success in the wider world. Others have unveiled products at ISPCON, and after face-to-face conversations with ISP attendees, who can be frank at times, found that returning to the skunkworks to make some previously overlooked product changes BEFORE a wider launch has saved literally millions of dollars of time, effort, and resource. One thing is certain, few ISPs are of the personality type to just smile and take the free T-shirt. True and worthwhile interaction between ISPs and the developers who tool them is virtually a signature of ISPCON. And there simply isn't anyone more familiar with Internet end-users than the Internet service providers.

I am more enthused about our session schedule this fall than any we've previously presented. One aspect of gaining a position as THE meeting place for ISPs is that we get more and better proposals for sessions with each passing event. This fall's schedule is utterly overwhelming.

Keynoting the event is John Sidgmore, vice chairman and chief operating officer for WorldCom. Sidgmore served as CEO of UUNET before it was acquired by WorldCom, and remains CEO of the subsidiary. He now claims that fully 25 percent of WorldCom's total revenues



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Arrival	Departure		Total room nights	
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A deposit is required for each room reservation. Check must be included with housing forms received by mail. If housing form is faxed or booked online, check must be received within seven (7) days of reservation or room(s) will be released. Some hotels may charge your credit card immediately. Reservations received by mail must be postmarked by August 17, 1998; after this date, rooms or rates cannot be guaranteed. Room assignments will be made in order of receipt. If all hotel preferences are not available, you will be assigned the closest available hotel. If rate requested is not available, the next available rate will be assigned. All changes or cancellations must be made to Lee Travel in writing before September 23, 1998. After this date you must cancel your hotel directly.

Mecklermedia works hard to secure the lowest room rates from each hotel.

#### HOTELS

The following hotels offer special rates to ISPCON Fall '98 exhibitors and attendees. Please contact Lee Travel Group to make your reservations. You must mention ISPCON to get the special rate.

San Jose Hilton and Towers
Rate: \$183 Single/\$198 Double

\$295 Exec. Suite/\$395 Hosp. Suite Addl. Prsn. \$15 Towers Upgrade \$25

Amenities: Cable TV and Internet access, exercise room, outdoor swimming pool and hot tub, business center, coffeepot, iron, ironing board, blow dryer, connected to the Convention Center, parking. \$7.00/day

Crowne Plaza San Jose Rate: \$159 Single/Double

Amenities: Cable TV, Internet access, health club, iron, ironing board, blow dryer, coffeepots, two phone lines and data ports, across street from Convention Center

Hyatt Sainte Claire Rate: \$180 Single/Double

Amenities: Historic architecture, cable TV, exercise room, service bar, coffeepot, iron, ironing board, blow dryer, room computers, down comforters, across the street from Convention Center

The Fairmont Hotel

Rate: \$205 Single/\$225 Double \$400 | Bdrm. Suite \$550 2 Bdrm. Suite

Addl. Person \$25

Amenities: Cable TV, in-room fax machine, modem at 9600 baud rt. voice mail, iron, ironing boards, hair dryers, fitness center, heated swimming pool, one block to Convention Center

Hotel De Anza

Rate: \$145 Single/Double \$375 Suites \$1,300 Penthouse

Amenities: Historic architecture, purified ice & water, cable TV, three phone lines and data ports, exercise room, service bar, coffeepot, iron, ironing board, blow dryer, 24-hour complimentary "Raid the Pantry," three blocks to Convention Center

Hyatt San Jose

Rate: \$175 Single/Double

Amenities: Selected rooms w/personal computer, fax, printer & high-speed Internet access, heated pool & spa, cable TV, complimentary parking and airport shuttle, two restaurants. Room rate includes a daily pass on the light rail for a 15 minute ride to the Convention Center

Best Western Inn

Rate: \$70 Single/Double \$80 Double/Double

Amenities: Free parking, complimentary continental breakfast, two blocks from Convention Center

Various cancellation and change policies apply. Please refer to your written acknowledgement from Lee Travel Group.

# Building a NOC, Squelching Fires, and Geeks

Sean Donelan, Data Research Associates, Inc.

Network Operation Centers (NOCs) support vital Internet services such as Domain Name Systems, e-mail, news and authentication. But a network is only as strong as its weakest link, with all links leading back to the NOC. Since Murphy's Law can strike anywhere, learn how to plan for the unknown, and regain customer confidence when things go really wrong. Discover how to improve physical security, loop diversity, OS and network data protection to better deploy and safeguard NOCs and data centers.

#### Network Migration - Moving Customers to Tomorrow Pushpendra Mohta,

Pushpendra Mohta, TCG CERFnet Inc

A quiet revolution is brewing in the data communications arena. The emergence of IP as the protocol of choice and

rapid convergence in the data and telephony business are dramatically changing the arch-itecture of modem telecommunication networks. Increasingly, multiple services will be delivered over one digital pipe. The Infobus is finally here! The pace of technology, reduced costs and the increased quality of the public network infrastructure, are driving organizations to outsource telecommunications services. Companies can no longer justify the time, staff or budget to piece together and manage multiple suppliers for voice, fax, data, video and Internet services. Outsourcing frees them to focus on their core competencies and benefit from this new network without being anchored

#### Distributed Network Element: The Next Generation of Gateways Nelu Mihai, AT&T Labs

down by legacy deployments.

Learn about the Distributed Network Element, which is located on a network node and a network element. This system behaves

# Network Design

like a single virtual network device. The control of the distributed network element resides on both the node and network element and data traffic can be switched/routed through both the node and the network element depending on the traffic requirements of the application. The communication between the two is done using a standard protocol (for instance GSMP). This structure is very scalable for multimedia applications and avoids an important bottleneck for high band-width traffic; the network node.

# Will Super Routers Reshape the Internet?

Mukesh Chatter, Nexabit Networks Inc.

Learn about the next generation of high bandwidth, terabit routers and the technology's financial and technical impact. Implementing this new routing technology could fundamentally change Internet services, ISPs and the Internet itself. The impact of new technologies, such as DWDM, on the Internet's core network and on ISPs remains to be seen. Beyond the technological implications are the business opportunities. ISPs can use the emerging super router architectures, with its inherent strengths and weaknesses, for better control and definition of a variety of services. Hear about the commercial opportunities terabit routers will offer ISPs, from QoS to multicast traffic.

#### **Building IP Backbones**

Chris Whyte, Cisco Systems

There are three major building blocks in a service provider's network: the backbone, the point of presence (POP), and access. The backbone is the key component to a service provider's infrastructure. The challenges of scaling, managing and designing reliable networks all begin in the backbone. If problems exist in the backbone, they can impact a majority of the POP and access infrastructure as well. We will focus on these challenges and discuss the importance of implementing a scalable routing architecture.

#### ATM for the Internet

Robert Sansom, FORE Systems Inc

Over the past few years, traffic on Internet backbones has increased exponentially. This demand for backbone bandwidth has resulted in large ISPs installing ATM backbone networks to provide the switching and transmission capacity that they need to support their customers. Although there is much hype today about the soon-to-arrive multigigabit speed packet routers, the reality is that ATM switching and control continues to offer much to the large ISP operators. In particular, ATM networks offer more superior traffic engineering and network resiliency than routed IP networks. This is evident from the fact that much of the functionality being proposed for MPLS duplicates the functionality of ATM networks. This session will discuss the ways ATM networks provide necessary functionality for Internet backbone networks. It will also describe how ATM networks interoperate well with routed networks today and MPLS networks tomorrow. In other words, it's not a question of ATM or IP but ATM and IP.

#### Access in the New Millennium

Kieran Taylor, Bay Networks

Thanks to the Telecom Deregulation Act of 1996 and advances in technology, Internet service providers face a wide array of transports when launching new, revenue-producing services. Matching transports to appropriate applications is crucial and can often determine the success of a service. In addition to tried and true transports like analog dial and ISDN, ISPs can deploy multiple forms of DSL and even cable connectivity. This presentation provides an overview of the current transport options, explaining the differences between analog, ISDN, xDSL (RADSL, HDSL, S-HDSL, IDSL, CDSL, MDSL, VDSL, etc.) and cable modem technology. In addition, this presentation demonstrates which transports are appropriate for which applications. Technologies will also be compared in terms of their business cases.

For a complete listing of educational sessions see http://www.ispcon.com





and over half of their growth comes from Internet access services. In a \$37 billion proposed merger with MCI, Sidgmore inarguably presides over the largest Internet access business in the world. He's dealt with every aspect of the Internet business from a startup, through funding, growth, an initial public offering, more growth, acquisition by WorldCom, more growth, government review of business mergers - literally everything that can happen to an ISP



John C. Dvorak

has happened to him. His views on the future of the network, the future of the Internet access business, and the future of technology, will likely directly affect what that future ultimately is.

And long time industry pundit John C. Dvorak has agreed to join us for our opening session festivities this year. Dvorak has one of the longest running and mostly widely followed columns in computer journalism in *PC Magazine*,



Dave Barry

and has also commented on the online world as the final word in each issue of *Boardwatch Magazine* for a number of years. His acerbic wit, and unavoidable skepticism born of nearly 20 years of watching products and fads come and go across the personal computer space make for a thoroughly humorous and usually profoundly informing presentation that boils the hurricane of confusion surrounding this space down to some common sense rules that all

#### 4

# DRIVE AWAY FROM SAN JOSE!

# Win A HUMMER!



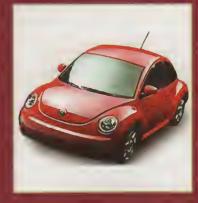
We're doing it again. Every ISP-CON Fall '98 attendee has an equal chance to win an AM General Hummer. You have

to be present as the convention closes on October I to win and you should be prepared to drive it away. Ask Steve Wilcox, an ISP in Monument, Colorado, who drove one home from ISPCON in San Francisco last September. Or ask Chris Candreva, an ISP in Rye, New York, who drove one home from the Baltimore convention in March. Someone will find his or her way home from San Jose in a Hummer.



# Win A VW BEETLE!

Making it so easy to connect businesses to the Internet is cause for celebration. That's why Netopia is giving you the chance to win a new 1998 VW Beetle. Visit Netopia at ISPCON, booth



#245, and register to win! No purchase is necessary.

You can also enter the sweepstakes anytime by pointing your web browser to: http://www.netopis.com/winabug.html

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products and all services must follow to succeed. Dvorak masters the maxims and rules of thumb for success in the high-tech world with such authority that he remains the most widely read computer columnist on the planet.

Finally, we have Dave Barry, one of the funniest commentators on all things in life, but particularly on the Internet and World Wide Web. As a humor columnist for the *Miami Herald* newspaper, Barry gained national acclaim through a series of syndicated columns appearing in newspapers around the country, a series of humorous books, and more recently via the World Wide Web with his own Web site competing with dozens of Dave Barry Fan Club Web sites across the netscape.

Major sponsors of ISPCON include Sun Microsystems, Intel, Hewlett-Packard, and 3Com Corporation, who will lead an exhibit floor of some 55,000 square feet that includes essentially every vendor tooling and enabling ISPs planet-wide. This is the smallest, most focused single show most of these companies exhibit at, but they do so with great enthusiasm at ISPCON.

Again, the Fall '98 show in San Jose is already shaping up as the largest we've ever cobbled together in one place and promises to be the most exciting and intense trade show event of the year. Nowhere will you find this many industry players, from this many different industry segments, all focused on Internet access in one place at one time. It is the ultimate opportunity to rub shoulders with the movers and shakers in this industry, and the ultimate place to fine tune your own strategic vision of where the opportunities are in the center of the network.

#### Jack Rickard

P.S. Yes, we did give away a brand new AM General Hummer vehicle valued at over \$75,000 at each of the last two shows. This has proven to be one of the most successful giveaways in all of the trade show industry. So yes, we're going to do it again. One lucky ISPCON attendee will drive home in an AM General Hummer vehicle.

# **Conference Agenda**

#### Monday September 28 7.30 pm Registration Desk Open 3:00 pm 10:30 pm Welcome Reception 7:30 pm Tuesday September 29 pm Registration Desk Open 7:30 am 7:00 9:00 am 12:00 noon Opening Session pm Exhibit Hall Open 12:00 noon -7:00 12:00 noon 1:30 Lunch On Your Own pm **Educational Sessions** 1:30 pm 2:30 2:45 pm 3:45 **Educational Sessions** 3:45 pm 4:30 pm Break in Exhibit Hall 4:30 pm 5:30 pm Educational Sessions Wednesdav September 30 7:00 pm Registration Desk Open 7:30 am Morning Keynotes 8:00 am 8:45 am Continental Breakfast 9:00 am 10:00 am **Educational Sessions** 10:00 am pm Exhibit Hall Open 7:00 10:00 am 10:45 Break in Exhibit Hall am 10:45 am 11:45 am Educational Sessions 12:00 noon 1:30 pm Lunch: Dave Barry 1:30 pm 2:30 pm Educational Sessions 2:45 pm 3:45 pm Educational Session 3:45 pm 4:30 pm Break in Exhibit Hall 4:30 pm 5:30 pm Educational Sessions Thursday October 1 7:30 am 3:00 pm Registration Desk Open Morning Keynotes 8:00 am 8:45 am Continental Breakfast 9:00 am 10:00 am Educational Sessions 10:00 am 6:00 pm Exhibit Hall Open 10:00 am 10:45 am Break in Exhibit Hall 10:45 am 11:45 am Educational Sessions 12:00 noon 1:30 pm Sponsored Lunch 1:30 pm 2:30 pm Educational Sessions 2:45 pm 3:45 pm Educational Sessions 3:45 pm 4:30 pm Break in Exhibit Hall 4:30 pm **Educational Sessions** 5:30 pm 5:45 pm Hummer Drawing Conference Adjourns A Note About Yom Kippur Please note that due to a scheduling conflict, ISPCON coincides with the Yom Kippur holiday on Wednesday, September 30th. We regret this circumstance and have taken all necessary measures to ensure that such a conflict will not occur at any of our future events.

# **XDSL**

#### The Top 10 Issues Facing Mass Market DSL Deployment

Frank Wiener, Paradyne Corporation

The presentation addresses the hurdles that need to be overcome to facilitate mass deployment of high-speed DSL services. Recent announcements of a splitterless DSL standard initiative and backing from Intel, Microsoft and Compaq combine to create the perception that mass market consumer scale deployment of DSL based service is just around the corner. While a splitterless standard may occur rapidly, service providers should recognize that the road to mass market deployment does have a few speed bumps. DSL's deployment challenges are discussed and some possible solutions addressing the issues.

# Offering High Speed Internet Access Through DSL

Chris Paulin, U S West !NTERPRISE Networking

Digital Subscriber Line technology has been touted as the solution to the "last-mile" bottleneck. By delivering megabit speeds over copper wires traditionally used to support voice services, DSL has the potential to deliver cost-effective bandwidth to the home, opening new markets for Internet services and applications. But how can an ISP offer these services to their customers without becoming a Competitive Local Exchange Carrier? This session looks at emerging DSL services offered by the Local Exchange Carriers, and provides a "how-to" and business case for ISPs interested in offering DSL services.

#### Profiting from DSL: New Partners, New Opportunities

John Kasha, Ascend Communications Inc.

Digital subscriber line (DSL) technology allows LECs and CLECs to transform existing analog phone lines into high speed, high-value digital access lines. It offers carriers a new resource with which to partner with systems integrators, businesses, and institutions such as hotels and universities targeted to niche market segments. Kasha will explore these and other options for carrier business opportunities, citing case history examples and lessons learned by carriers who are already venturing into this new territory.



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# CLECs

# Why Should Your ISP Become A CLEC?

Rudolph Geist, Wilkes Artis Hedrick & Lane

Focus on why your ISP should obtain status as a Competitive Local Exchange Carrier (CLEC) in each state where it provides services. Panelists will discuss the business implications of obtaining CLEC status, such as the costs of the process, resulting savings on telco lines, reciprocal compensation, regulatory burdens - as well as how the actual certification process works. The panel will feature key state regulatory staff who handle certification applications, an expert representative from the telephony switch manufacturing industry, and a representative from an ISP who has obtained CLEC status.

# Becoming a Competitive Local Exchange Carrier

David O'Neil, Rini Coran & Lancellotta PC

The passage of the Telecommunications Act of 1996 has resulted in competition in the local telephone market. ISPs do not enjoy the same rights to interconnection that are enjoyed by CLECs. Therefore, ISPs, in their attempts to gain access to high-bandwidth lines, may decide to become CLECs and build the alternative high-bandwidth access themselves. This session examines the advantages and disadvantages of becoming a CLEC, and how to become a CLEC. Representatives of the CLEC industry have been invited to share their views along with representatives from ISPs.

# The Real Benefits of the ISP/CLEC Partnership

David Fowler, Electric Lightwave Inc

This session will share the advantages and benefits ISPs can gain from a good business relationship with a full-service CLEC. Attendees will hear how this partnership can help ISPs develop and deliver products and services that set them apart from the competition. Specifically, this session will address the benefits CLECs provide ISPs interested in geographic expansion to assist them in meeting their requirements for installing additional services.

#### CLECs vs. ISPs

John Giere, Ericsson

John Giere will review the access charge issues. Learn why ISPs are becoming CLECs and focus on the reciprocal billing issue. Also, rights and obligations of CLECs will be discussed. Specifically, one reason to become a CLEC is the provision that requires ILECs to pay termination fees to compensate CLECs for call completion. On the downside, we will discuss the obligations of becoming a CLEC which include universal service obligations and other regulatory requirements imposed on telecommunications carriers.

# Government & Legal Issues

# How Can Your ISP Stay out of Regulatory Shadows?

Rudolph Geist, Wilkes Artis Hedrick & Lane

This panel will review what Internet services are under consideration by federal and state authorities for treatment as regulated telecommunications services, thereby making the ISP who provisions the services a regulated telecommunications company.

The panel will focus on how ISPs, such as Internet telephony and similar service providers, can adapt their business to the inevitable reality of regulation. The panel will also focus on how ISPs can participate in the regulatory process to ensure that any regulation is fair and non-discriminatory. Panelists will include key FCC and state regulators, a representative from a national ISP trade association, and a representative from an ISP helping to shape new national policies.

#### I Used To Be From The FCC, and I am Here To Help You

James D Earl, Covad Communications

In its April Report to Congress on Universal Service, the FCC maintained the delineation between telecommunications and information services, but clearly indicated that phone to phone Internet telephony should be regulated the same as circuit-switched POTS. What does this mean for ISPs considering becoming CLECs? By August, the FCC will release a required notice of inquiry to

determine whether high-speed, broadband capability is being deployed to all Americans in a reasonable and timely fashion. Several Regional Bell companies have already indicated they believe they should be relieved of the long distance restrictions imposed by the Telecommunications Act of 1996 in order to build and operate regionally oriented Internet backbones. What does this inquiry mean to ISPs for whom the RBOCs are both suppliers and competitors? Hear a clarification of the latest developments on the regulatory landscape and place them in a business perspective meaningful to ISPs.

# The New Commercial Internet: Where Do We Go From Here?

Don Telage, Network Solutions Inc

The evolution of the Internet from a research and education network to a commercial medium has brought dramatic growth and a new set of issues that are stressing the current underpinnings of the Internet. This session explores the evolution of the commercial Internet and discusses the need for a new legal structure, new infrastructure and new business models to support it. The session also explores the potential role of government in this new media and the issues of potential regulation.

#### The Power of Partnerships

Russell Pillar, Prodigy Internet

The industry is rife with examples of "cooperation" - partnering with your competitors. Forging strong partnerships is what makes a strong company in the Internet space. From growing subscribers by the bucketful - not one by one - to making the Internet easier for subscribers, picking the right partner and creating distinctive deals makes a successful ISP.

# The Legal Art of Establishing Web Site Agreements

Eric Bakri Boustani, Davis & Schroeder PC

Commercially developed Web sites are everywhere. Laws protecting or defining Web sites are not. Technological developments and consumer demands have outstripped the legal framework for Web site development. Slower-paced Internet law has yet to evolve into a conventional format and create workable, standard form agreements. On the other hand, basic legal issues involved in the development of any Web site remain fairly easy to identify. Know the legal basics scrutinized by developers and customers alike before developing a site. Discuss a variety of legal topics, including agreements, creation hosting and maintaining Web sites within the context of contracts, copyright, trademark, assignment of liability and jurisdiction.



#### FIFTH STATE The most dynamic group of Internet giants wi current industry trends, products and s 1700 Cobalt 1631 1627 1621 1602 1605 1609 1613 1617 1624 Rocks 1601 Tut Mirror Hallma **Bigfoot Systems** Image Comput 3Com 1400 Corporation 1431 1413 1417 1421 1424 1427 1402 1409 1305 Net-1200 Holon-Tech ipswitch 1-800 St Compaq Solunet **Partners** IC Verify DPEC Sc 12 31 12 N2H2 1216 1202 1221 1224 1227 Hewlett-1209 1201 **Packard** ISP Service Mgt. 1100 iBeam Broad-Verio Web 1000 Looksmart **SAVVIS** Compag 1024 1027 News 1001 1002 905 1009 1021 FinePoint 929 Xedia Corp. THiiN Line Planet Direct **IBM AboveNet** 800 StarNet 829 811 814 821 825 809 817 Netwo Two 801 902 Mediagate **PSINet Bay Networks** Cisco Boardwatch Sentient Servint 625 612 629 602 605 609 621 Check Point 601 **Booth Company Name** 529 V-One Icon CMT 424

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315	I-800 Support
305	3Com Corporation
811	AboveNet
131	AccuWeather
133	AcuComm
317	ADSL Forum
534	Advanced Computer Communications
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440	Allot Communications
638	Alteon Networks
252	Amplify.net
238	Andromedia
440	Ascend Communications
449	Assured Access
452	Assured Digital, Inc.
331	Balboa Capital
612	Bay Networks
417	Bigfoot
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430	Nokia IP Inc.
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1253	Pacific Bell
856	Personal Productivity Tools Inc
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629	PSINet
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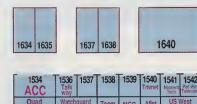
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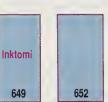








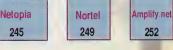












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- 1017 Transend
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- 1015 **TUCOWS**
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- 148 Vienna Systems
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#### **Exhibit Hall Hours**

**Tuesday** September 29 12:00 pm - 7:00 pm

Wednesday September 30 10:00 am - 7:00 pm

**Thursday** October 1 10:00 am - 6:00 pm

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- Wyndows techknow 429
- 1013 Xcom Technologies
- 817 Xedia Corporation
- 434 Xyplex Networks
- 1438 Zoom Telephonics, Inc.

The above information is effective as of 8/5/98.

For an updated list of exhibitors and a current floor plan visit www.ispcon.com

# Virtual Private Networks

#### Building and Deploying Virtual Private Networks

Don Rule, Microsoft Corporation

ISPs are looking for ways to move up the value chain by providing Virtual Private Networking services on their networks. This session will describe ways to overcome the security and distribution problems that are inherent in Virtual Private Networks. It will explore authentication, access control, auditing, and administration for both service providers and corporate consumers.

#### VPN Basic Technology

Bernard Aboba, Microsoft Corporation

Learn the basic technology behind virtual private networks, including PPTP, L2TP, and IPSEC. The session will include an in-depth discussion of VPN deployment planning, as well as a comparison of today's technologies, including a discussion of security and performance issues.

# Virtual Private Network Services: IP or Layer 2 Based?

Chris Baldwin, Argon Networks

There is industry consensus that Virtual Private Networks (VPNs) are important. But the clarity stops there. There are nearly as many ways to implement VPNs as there are vendors. VPNs can be set up with Layer 2 technologies such as ATM or Frame Relay. Alternatively, they can be implemented with IP technologies such as tunneling, Network Address Translation (NAT) and now Multi Protocol Label Switching (MPLS). This presentation will review the technologies and application environments for VPNs and show how these different tools can be used in different parts of wide area networks.

# Realizing the Promise of Virtual Private Networking

Jim Bodi, Intel Corporation

Affordable wide area networks (WANs) show promise as a key product for ISPs to

develop and exploit. Hear about some of the trends and consumer anxieties currently affecting the implementation of VPNs. Security is foremost on the minds of customers considering an Internet VPN solution, but quality of service, bandwidth and manageability are also worries. Security solutions are available today, and because of the demand for higher bandwidth and better quality of service for VPN applications, many carriers and ISPs are making significant investments in their network infrastructures to offer better baseline services.

## Extending the Enterprise Network to Partners and Customers

Bruce Chovnick, Network Solutions Inc.

What is the most efficient way to create a Virtual Private Network (VPN)? Who should be a part of your company's VPN? This session looks at VPNs from an infrastructure perspective including issues of outsourcing. The session also addresses important elements of security, connectivity, and network management.

#### Virtual Private Networks: The New World of Services

Susan Scheer, Cisco Systems

HUMMER

APITOL HUMME

Virtual Private Networks (VPNs) enable service providers to differentiate their services to business customers, increase profitability, and improve customer loyalty. The presentation explores the market dynamics and tremendous opportunity afforded through Access VPNs, Intranet VPNs, and Extranet VPNs. It also discusses the technologies that service providers will implement in building a scalable and flexible infrastructure for VPN service delivery and management.

# IP Routed VPN - New Strategies for Secure Enterprises

Richard Kagan, VPNet Technologies Inc

Many corporations are reluctant to conduct their private business over the public telecommunications infrastructures. While they trust their own internally operated enterprise LANs and WANs, when they deal with outside service providers they worry about

is sues seemingly beyond their control - such as service quality, network performance, and data security. Corporate reluctance to leverage public telecommunications infrastructures can impede company growth and give competitors a significant edge. Fortunately, new IP-routed Virtual Private Networks (VPNs) allow businesses to preserve control of their data traffic, even when routed across the public network.



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# Network Management and Security

Security Applications in a Distributed Environment

Howard Gittleson, Bell Laboratories

The development of Internet business communication, including Virtual Private Networks (VPN) and electronic commerce, is delayed because of concerns over network security. This session will illustrate new techniques in network security and how these techniques may benefit ISP customers in addressing their security concerns. In addition, the session will cover the NACHODI REPLACED need for distributed security to take advantage of new Internet, Intranet and VPN business applications.

> Root Name Server Operations and DNS Security Mark Kosters. Network Solutions Inc.

Today's Domain Name System

(DNS) is critically dependent on a system of 13 worldwide root servers. The focus of this session is the day-to-day operations of a root server operator, covering everything from DNS problems and DNS tricks to system monitoring and network security. The session will also address the upcoming release of secure DNS (aka DNS safe) and what it means to Internet service providers and end user sites.

#### A Guide to Directory Services Technologies

Scott Williamson, Network Solutions Inc.

There is a tremendous business opportunity in the next few years for Internet service providers who can offer support of directory service technologies. This session will provide a survey of current directory service technologies. It explores the various protocols used, inter-enterprise configurations, and who the players are developing these technologies.

#### Spam Filtening and Porn Filtening: The ISPs Dilemma

Paul Hoffman, Internet Mail Consortium

Filtering can be a blessing and a curse. It can help reduce the pain of spam for ISPs and their customers, but it can also lose important e-mail. Porn filtering can be a helpful service to offer, but today's filters block access to some non-porn sites. There is possible legal liability to an ISP for losing mail or inappropriately blocking access, and filtering can increase customer support costs. This session covers why you might choose to filter, the legal and administrative problems of filtering, and how to reduce the problems.

#### Controlling Unsolicited Mail or "Spam"

Eric Allman, Sendmail Inc

The number one problem in Internet mail today is "spam" or junk e-mail. Allman will demonstrate how ISPs and other mail administrators can control unsolicited e-mail with newly available tools and approaches.

#### Differentiated Services: QoS & New Core Standards

Ram Krishnan, Nexabit Networks Inc.

This strategic technology briefing will address the new technologies and characteristics required to improve the Internet's stability and performance, and to successfully launch new classes of service. Krishnan will discuss the Internet's usability and profitability potential, realizable through differentiated services and critical success factors for effective QoS architectures. The session will also cover sustaining QoS internetworking between Frame Relay, ATM and IP, aggregate reservation of flows using RSVP, RED and Fair Queuing approaches and their implications for users and providers, and traffic engineering in MPLS and other label-switching protocols.

## Improving an ISP's Quality of Service

Chuck Darst, Hewlett-Packard

Discover new ways to manage and improve ISP services, including e-mail, news and Web access. Learn how multiple-point measurement technologies can help an ISP track server performance, provide information for business trend analysis, and provide information for customer help desk operators.

#### Developing An IP Management Strategy

Pamela Moffitt, Dodge, Ascend Communications Inc

The rapid evolution from voice to data dominance has left many service providers scrambling to deal with unique IP management issues. Service providers now must find a way to bring scalable management control to IP networks. issues include accounting methods to charge for IP services; the amount of information to share with subscribers; scalability to address the exhaustion of IP addresses; providing IP Virtual Private Networks; and providing IP Quality of Service. Dodge will address these issues, identify the questions that service providers must answer to best manage IP and detail ways to bring scalable management control to IP networks.

#### Managed Port Services - New Goldmine for ISPs

David Markowitz, Ascend Communications Inc.

While voice communications remains a big business, it is relatively static when compared with Internet and data services, which continue to grow at an unprecedented rate. Data services are expected to continue to outpace voice services over the next several years, forcing carriers to develop new strategies to garner a piece of this fast growing market. In his presentation, Markowitz will describe one of the next major data service revenue opportunities available for Local Exchange Carriers (LECs) and Competitive LECs (CLECs): offering wholesale ports to Internet service providers (ISPs).

CEO of UUNET Vice President of WorldCom

John Sidgmore

President and

ohn Sidgmore joined UUNET Technologies in June of 1994 as president and chief executive officer. Over the past four years, UUNET increased its annual revenues from \$7 million to \$600 million, and is now the world's largest Internet access provider with over 2,000 employees. Sidgmore steered UUNET through a series of rapid-fire mergers that expanded his company into a global presence. In 1995, UUNET launched

the third most successful initial public offering on NASDAQ for that year. In 1996, UUNET joined forces with MFS Communications Co. in a merger valued at nearly \$2 billion. That winter, WorldCom, Inc. acquired both MFS and UUNET in the fourth largest merger in corporate history. Then in the fall of 1997, WorldCom

announced a pending merger with MCI, potentially the largest merger in U.S. history. During the winter of 1998, WorldCom orchestrated a three-way transaction in which WorldCom/UUNET would acquire the infrastructures of ANS and CompuServe and secure a multi-billion dollar, five-year contract with AOL.

Before joining UUNET, Sidgmore was president and CEO of CSC Intelicom (formerly Intelicom Solutions). CSC Intelicom was the largest independent software company in the telecommunications industry, with about \$100 million in annual revenue and 600 employees worldwide. Sidgmore received his B.A. in Economics from the State University of New York in 1973.

Since 1976, John C. Dvorak has been stirring up the micro-computer industry. He started a software company in 1978 and by 1980 the business was so successful that he had to quit his job and run the company full time. At the same time, he began a newsletter called the Softwore Review.

In 1982, because of his knowledge of computers, contacts in the field, and writing skills, he was approached by CW Communications to edit a growing journal called *InfoWorld*. After two years at the position, two book contracts required that Dvorak concentrate on writing. In 1981 he dissolved his software firm and has been writing full time since.

His work appears regularly in **Boardwatch Magazin**e as well as computing and networking magazines, and newspapers around the world. He has written numerous books including Dvorak's Inside Track to DOS & PC Performance, Dvorok's Guide to PC Telecommunications, Dvorak's Guide to PC Connectivity, and Dvorok's Inside Track to the Moc.

Dvorak does a weekly syndicated radio show, "Software/Hardtalk." Dvorak has appeared on "NBC's Nightly News" and "Overnight," and hosted "Computerworld Special Reports," as well as appearing in several other television venues.



John C. Dvorak Writer and Commentator

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Marc Andreessen, Cofounder and Executive Vice President, Products Netscape arc Andreessen founded Netscape in April 1994 with Jim Clark. As executive vice president, products, Andreessen oversees the technical direction of the company. He has been a director since September 1994. As an undergraduate at the University of Illinois in Champaign, Andreessen created the NCSA Mosaic browser prototype for the Internet with a team of students and staff at the university's National Center for Supercomputing Applications (NCSA). With a friendly, point-and-click

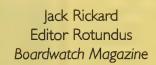
method for navigating the Internet and free distribution to network users, NCSA Mosaic gained an estimated two million users worldwide in just over one year. Andreessen earned his bachelor of science degree in computer science at the University of Illinois in 1993.



Don Listwin
Executive Vice President,
Service Provider and
Consumer Lines of Business
Cisco Systems, Inc.

on Listwin is executive vice president of the Service Provider and Consumer Lines of Business at Cisco Systems focusing on providing solutions for Internet service providers, telephone carriers and cable and wireless companies. He previously served as senior vice president of Market Development and vice president and general manager of Cisco's Access Business Unit. Earlier, he was vice president of Marketing, responsible for establishing the Cisco IOS software franchise. Listwin joined Cisco in 1990 and developed IBM internetworking strategies.

Listwin holds a B.S. degree in electrical engineering from the University of Saskatchewan in Canada.



ack Rickard is a columnist with and editor rotundus of Boardwatch Magazine and Boardwatch's Directory of Internet Service Providers. He is also creator of the Internet Service Providers Convention (ISPCON). Before founding Boardwatch Magazine, Rickard spent 12 years developing communications and electronic technolgies for the defense and aerospace industries with McDonnel Aircraft Corporation, Emerson Electric Electronics & Space Division, Martin Marietta Denver Aerospace and Martin Marietta Data Systems.

# Voice, Fax & Multimedia Voice Over IP: Profitability by Lowering O

ISPs: Seize the Internet Fax Advantage

Ben Feder, .comfax, Inc

A business adage for the late '90s might read as follows: when the going gets tough, the tough offer value-added services. ISPs would do well to contemplate this strategy, because the going is going to get tough during the next few years. ISPs can bolster their position and bottom line by offering value added services, such as Internet faxing. It's a high demand service with a low ante - if ISPs play their right cards.

# The ISP IP Telephony Market Launch Model

Bill Perren, NetWorks Telephony Corp

This session features the steps necessary to ensure a successful Internet telephony introduction, from the planning stage to full market launch. The session will also describe the investment and return ISPs can expect based on current and future financial models for ISPs to providing telephony services.

#### Filling IP Telephony Pipes Rob Warmack, eFusion Inc

Voice over IP applications and virtual private networks are driving frenetic infrastructure investment. Most of this activity centers around phone-to-phone usage, and neglects potent traffic drivers that address PC to phone use, driven by the incredible growth of the World Wide Web. Successful network providers will position themselves to address high value-added, multimedia IP telephony applications. Learn how to deploy your network and build a strong subscriber base that will demand a wide variety of enhanced services.

#### Windows NT 5.0 Preview

Bernard Aboba, Microsoft Corporation

Get a sneak preview of Windows NT 5.0 networking functionality, including Active Directory, security, RAS and Routing, ATM, IP Telephony, and quality of service.

# Universal Service Platforms in The IN and Internet Community

George Vanecek, AT&T Labs

The gaining popularity of the Internet has driven an explosion of innovation, which has been followed by the Intelligent Network (IN) community focused around the PSTN. IN supports the creation of new services for enhanced features on calls in the PSTN. For the most part, the Internet and the telecommunication IN domains are separate, but trends indicate they may be merging. This session compares two emerging platforms, the IN's Telecommunication Information Networking Architecture (TINA) and the Advance Network Service Platform named GeoPlex, and presents the benefits of adopting such platforms.

# Comparing Platform Choices for IP-fax and IP-voice

Tony Dutra, Open Port Technology Inc.

IP-telephony "Gateway" and "Gatekeeper" vendors typically propose that fax and voice should be handled with the same hardware and software platforms. They also maintain that the ability to discriminate between the two and then invoke the appropriate "codec" - is the only difference in terms of how calls are processed. Is this really the case? Learn to differentiate between both real-time and storeand-forward solutions - fax versus voice. Hardware and software issues will be handled separately. Hear some the hidden pitfalls in building a fax subsystem into a voice-based network service.

#### The ISP as a Local Media Outlet

Gene Kusekoski, Compaq Computer Corporation

First there was radio, then TV, and now many people are referring to the Internet as the next mass medium. But the Internet today lacks the organized distribution model required to make this a reality. This session explores the multimedia value-added services an ISP can deliver today, independently or in collaboration with traditional media outlets. The leading technologies and blueprints for success will be discussed.

# Voice Over IP: Profitability by Lowering Cost - Not Quality

Prabhu Kavi, Ascend Communications Inc.

With the world voice services market estimated at \$400 billion a year, little wonder that many new service providers are entering the market. As VoIP competition intensifies, success will largely rest not only on the ability to attract and maintain a loyal customer base by offering quality services, but also on minimizing internal costs. For example, bandwidth costs are coming down because of increased fiber buildout and Wave Division Multiplexing (WDM), which benefits both fiber-based and leased bandwidth carriers. In his presentation, Kavi will examine the potential pitfalls for new

voice service providers and how they can avoid them.

Voice Over Frame Relay vs. IP? Tried & True vs. Tried & New

Tim Kraskey, Ascend Communications Inc.

The days when voice traffic was the sole province of the public telephone network are long gone. Many alternatives are now offered. The tried and trues - voice over Virtual Private Networks (VPNs) and voice over Frame Relay - are widely accepted and used. Now a new approach - voice over IP is being tried as an alternative. But although voice traffic over IP presents an attractive alternative to the telephone for external calls, there have been concerns over the newness of the technology. In his presentation, Kraskey will address these concerns and discuss the changing landscape for voice traffic, examining the different approaches available.

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# Top Ways To Build A Stronger Profit Stream For Your ISP

Christopher Knight, Knight Technologies Group

Profit. ISPs can't seem to get enough of it. We all want it, but why are only a handful in the black while others run in the red with no plan to turn it around? In this session, you will learn marketing and sales savvy techniques that will help you build a strong, recurring revenue and profit stream, which will allow you to get into a positive business building habit.

#### Build A Million Dollar ISP In Your First Year

Christopher Knight,
Knight Technologies Group

In this session you will plot a course for your ISP, which will guarantee that if you implement the action items we'll be discussing in this session, that you will

have a seven-figure year end. All it takes is a little planning, and the right amount of massive intelligent action, sharply directed with focused attention on your vision and the purpose you have set for your ISP. You will leave this session with some fresh perspectives and mind opening ideas on what is truly possible when you set a written goal, and take action to its attainment.

#### Making Your Small Company Seem As Big As Godzilla

Mike Heller, Cisco Systems

You're an ISP, and you offer great service to your customers. The problem is that not many people know about you, and your budget doesn't allow for much advertising and promotion. How can you be sure your name gets more widely known, and that your company's offers are seriously considered right along with proposals from the international mega-carriers? There is a way, and you don't have to win the lottery to do it. Learn how to leverage your supplier's image, advertising, Web site, etc. to boost and expand your business.

## Internet Marketing to Small Consumers and Small Business

Ray Solnik, Pacific Bell Internet/ Southwestern Bell

This presentation outlines how RBOCs must creatively market Internet services to consumers and small businesses, breaking through the Internet clutter and communicating to those who may not understand the Internet phenomenon. It also focuses on churn reduction, winback and activation specifically in the ISP market.

# ISP Marketing 101 - Why Most ISPs Fail Christopher Knight,

Knight Technologies Group

A typical ISP will setup shop, invest in the right equipment and people to get their ISP going, but once the network is up, they fail in as little as 6-12 months, because they have no money left to pay for the costs to acquire new customers, and a catch-22 begins. This session will give you the top seven reasons most ISPs fail from the start, and what you can do to make sure this does not happen to you.

# E-commerce

#### E-Commerce: Opening a New Sales Channel

Fern Halper, Lucent Technologies

E-commerce is a powerhouse application that meets the needs of today's service providers and enterprise customers. Its high performance, fault tolerant, secure configuration offers a gateway to secure Web communications and transactions for business success. This session will cover market trends and industry drivers, and advantages to implementing an E-commerce storefront. We will explore return on investments, profits and customer service advantages to implementing an E-commerce procurement system. We will also discuss offsetting the security risks through audit and control measures.

# Development/Deployment of E-Commerce by ISPs and Other Hosts

Jeff Watts, INTERSHOP Communications Inc

As Internet standards and infrastructures become more widespread within businesses, their performance, flexibility and reliability will be crucial for the businesses investing in the Web. E-commerce will especially benefit from the capacity and capabilities of the ISPs since multi-store hosted E-commerce products allow ISPs to offer users lower cost and higher performance E-commerce products by amortizing server, software and management resources across a wider family of users. This session will discuss the advantages on multi-store hosting and will include case studies of the implementations by Deutsche Telekom and New Zealand Telco.

#### Internet Electronic Commerce: The Need for Standards

James Walker, Network Solutions

In electronic commerce, business partners interact through electronic communications and automated computer systems. E-commerce is used by small businesses and governments to speed the exchange of information, gain improved service levels, and reduce operating cost. The burgeoning demand to use the Internet as a conduit for E-commerce far exceeds the ratified standards and trading agreements necessary to conduct business in a global manner. Topics covered in this session include E-commerce standards for infrastructure, interoperability, technology and governance.



Dave Barry Syndicated Humor Columnist Wednesday, September 30,1998 12:00 p.m.

sponsored by



ave Barry is a syndicated humor columnist whose often-amusing articles appear in hundreds of newspapers every week. When he is not writing his columns, Barry writes for the Miami Herald's Tropic Magazine. Barry has won a Pulitzer Prize for several of his humor columns in the category of Distinguished Social Commentary in 1988 and is the lead guitarist in a rock band called the Rock Bottom Remainders. Barry is the leader of the Urban Professionals and an allaround nice guy who tries to protect his readers from the dangers of the world around them, like exploding cows and trout falling from the sky.

Barry's most recent piece of work, *Dave Barry in Cyberspace*, epitomizes the way many people feel about computers. According to Barry, "The function of RAM is to give guys a way of deciding whose computer has the biggest, studliest, most tumescent memory. This is important, because with today's complex software, the more memory a computer has, the faster it can produce error messages. So, the bottom line is, if you're a guy, you cannot have enough RAM. Bill Gates currently has over 734 billion 'megs' of RAM, and he still routinely feels the need to stuff a zucchini in his underwear."

Barry has emerged as something of a cult hero online with numerous Web sites, mailing lists, and Usenet newsgroups devoted to his humorous columns.



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# Luncheon Speaker

Thursday, October 1, 1998, 12:00 p.m.

sponsored by



mediagate

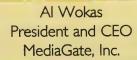
lan Wokas is co-founder, president and CEO of MediaGate, Inc. and his primary interest in life — OK, second primary interest in life — is getting ISPs to generate more revenue and profit! Wokas will share with you his perspective on how the universal communication server platform will affect the ISP competitive land-

scape, what the next generation of killer apps and big money opps are, and why the MediaGate proposition is the best investment you can make in protecting your future.

In 1988, Wokas cofounded Rhetorex, Inc., which developed the first multi-line, DSP-based computer telephony board. Wokas was president and CEO of Rhetorex from 1988 to 1996. Rhetorex was subsequently acquired by Lucent Technologies. In 1981 he cofounded Vynet Corporation and served as its president and CEO until 1988. Vynet developed the world's first PC-based voice processing board. He earned a BS in electrical engineering from Michigan State University and completed all course work for an MBA degree at the University

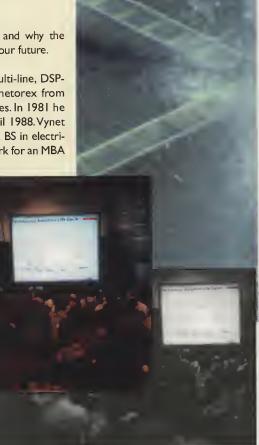
of Santa Clara.

Don't miss this opportunity to discover how to beat out your competition!!!



ISPs: Next
Generation
Services!
More Profits!

Don't lose
your
customers to
another ISP!
Do better
than survive!



# Marketing for ISPs

# Hosting Applications on Windows NT/MCIS 2.0

Chris VandenBerg, Microsoft Corporation

To achieve a competitive edge and achieve a higher profit margin many ISPs are looking at hosting applications for corporate use. This session will look at the issues involved with providing an environment for shared Web applications in service provisioning, determine the appropriate level of customer administration and the tools available to deploy such services.

## Marketing and Business Strategies for the Internet

Doug Wolford, Network Solutions Inc

The Internet, intranets, and virtual private networks have changed the rules of engagement for business executives, who have to be grounded not only in the latest technologies, but must also be able to produce solid business results in rapid fashion. This talk introduces executives to marketing and business principles germane to the Internet environment - from enhancing brand equity to increasing earnings per share.

#### Growth on the Internet: Leading Indicators, Future Trends

Gabe Battista, Network Solutions Inc

Domain name registrations remain one of the most definitive yardsticks for measuring the Internet's growth. Network Solutions, the operator of the InterNIC, is at the center of this expansion. Battista will give highlights of the domain name growth, a look at regional trends, name trends, business uses and associated issues of trademarks versus domain name rights. Battista will also ruminate on the nature of electronic commerce, its growth and future trends.

# Web-Based Self-Service: A New Medium for Customer Support

Keith Loris, ServiceSoft Corp Karen Todd, Wang Global Internet Services Division

Together, ServiceSoft and Wang Global will present a case study highlighting how providing self-service software to support analysts can solve a number of customer service problems. This presentation will cover what factors companies need to evaluate when considering self-service support applications, how to most effectively deploy the software, and how to measure the success of such a deployment.

#### Here's the Meat - Not Add-Ons - But Smart Business Practices

David Robinson, South Texas Internet Connections Inc

An ISP that does not turn a profit has a hobby, not a business. This session drills down to where companies are leaving the profits on the table Increasing profits without increasing spending is the key. It discusses an actual business scenario where a \$10 per month Internet service can profit, grow, and lead a market. This session demonstrates why running a good service does not insure a successful business. It will focus not on limitations, but real-world strategies that can grow your business.

# Growing Your ISP on a Shoestring Budget Christopher Knight

Knight, Technologies Group

Put on your marketing hats, and let's talk about how you can grow your ISP overnight, on a surprising low marketing budget, through marketing and sales guerilla warfare strategies and tactics. You can be assured they won't know what hit them after you implement the seven proven strategies we'll be talking about in this session. You will leave this session with plenty of marketing savvy action items you can implement, and gain the competitive edge you've been looking for:

#### ISP Marketing Action Item: Get Your Plan Into Action

Christopher Knight, Knight, Technologies Group

Every ISP needs a marketing plan, with a specific focus, in order to get the maximum return on its marketing and sales investments. In this session, you will learn how to prioritize which marketing investments will produce the highest yield, and will setup a playby-play

a ction
plan to not
only learn how
to decide what will
work best for your
ISP, but how to setup a
system for identifying which
of your efforts are responsible
for the best bang for your marketing buck.

# Top Strategies To Grow Your Dial-Up Customer Base

Christopher Knight, Knight Technologies Group

If you study successful ISPs, you will find they have common denominators which set them apart from the ISPs who fail. This session covers the top seven strategies successful ISPs use to grow their dial-up customer base, and includes hints, tips, tricks, secrets and strategies to ensure that you will be armed with enough ideas and information to make sure your ISP has the best competitive advantage possible.

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# Investment & Finance

# Alternative Revenue Model For ISPs and Web Sites

Eric Goldman, Cooley Godward LLP

This session will explore and critique alternative revenue models ISPs and Web sites USE to enhance and build competitive advantages. Goldman will provide real-life examples of companies

— successfully and unsuccessfully — deploying their business models, and



Fundamental Investing in the Internet & Communications World

Paul Stapleton, Rampart Associates Inc

Paul Stapleton is a Graham-Dodd, Warren Buffet fundamental investor trying to do business in a high technology, earnings-bedammed world. His investment philosophy, coupled with an outrageously over-valued public stock market, makes it tough for him to find good investment opportunities. And when he does find something he thinks is a winner, he's rarely anxious to talk about it. Stapleton has agreed to make a few comments about Internet and communications companies and markets he thinks have been misunderstood and undervalued. Come listen to what he thinks are the few good bets today.

# Debt Financing for ISPs — A Banker's Perspective

Brent Malcom, Norwest Communications Finance

Why is it difficult for bankers to understand and support ISPs? What characteristics does an ISP need to qualify for a bank loan? These questions, and many more, will be answered in this session dealing with the banker's view of financing an ISP. Find out what business facts are important to lenders and take home checklists for approaching local lenders and industry-specialized institutions.

# Identifying Hidden Assets That Most ISPs Overlook

Christopher Knight, Knight, Technologies Group

Most ISPs are sitting on a gold mine right under their nose and if they looked up, it would hit them right in the pocketbook. In this session, you will learn how to identify hidden assets that you already possess within your ISP but are not fully realizing their maximum potential profit. You will also learn strategies you can implement immediately, at little cost to you, but with a higher return than you may have thought possible.

# 25 Ways to Bring Cash into Your ISP! David Silver,

Santa Fe Capital Group

This session was standing room only in San Francisco '97. It describes ways ISPs can raise a lot of cash in a very short time. Some of these 25 ways will generate more then \$100,000 in one week and others will generate \$200,000 to \$500,000 in 90 days. This session also explains how to buy a neighboring ISP using its cash flow. Santa Fe Capital Group's booklet "25 Ways to Bring Cash into Your ISP" is complimentary to all attendees of this session.



### CEA Montgomery Financial Seminar 9:00 am Wednesday September 30, 1998

CEA Montgomery, a boutique investment bank that has worked extensively with Internet services companies, will be sponsoring a special financial program at the upcoming ISPCON. The program will cover financial matters of interest to senior executives of ISPs and webhosting companies and financial professionals working with those companies. Topics will include a review of recent major mergers and acquisitions; current valuations for ISPs and webhosting companies; and the future direction of the industry, including the impact of the roll-out of xDSL systems, and the role and influence of next-generation carriers. This program is designed to offer insights to service providers on the strategic options available to them in the current market. The speakers will include senior executives of major Internet services companies, as well as influential consultants and commentators.

# ISPCON sessions will cover a variety of pertinent business and technical topics. For an updated session list go to www.ispcon.com. From IP telephony to multiplexing, from marketing strategies to initial public offerings, here is a sampling of the useful sessions offered:

# Maximizing Bandwith

# The New Era of Web Switching for ISPs Dominic Orr, Alteon Networks

Content-smart, Web switching is one way to develop high-availability services, represents the next step in ISP network infrastructure buildout. Based on new techniques that direct and manage entire Web sessions, this new form of intelligent switching has been specifically designed for the World Wide Web - to eliminate single points of failure within ISP networks while enabling more intelligent distribution of Web traffic. Orr's presentation will focus on the impact of this new technology on ISPs and the Internet along with the implementation issues, problems and future of the new technology.

#### New Web Cache Redirection Technology for ISPs

Shirish Sathaye, Alteon Networks

Performance and availability are two of the highest priorities for ISPs. Among the hottest and most popular new advances in ISP infrastructure technology to address these two issues is the marriage of Ethernet switching and session-aware services, such as Web cache redirection and server load balancing. Sathaye will examine the specific issues ISPs face in increasing the performance and availability of their services. He will detail how this new technology works and can be deployed by ISPs to reduce costs and increase service availability.

# Moving the Web to the Edge of the Network

Doug Humphrey, SkyCache

In analyzing bandwidth problems faced by the Internet today, the short answer is to add to the existing network infrastructure, but, are there alternatives? Caching, moving Web traffic to the edge of the network appears as a viable alternative. Why keep our noses to the ground in search of solutions, when an answer is right overhead? Satellite data broadcast - a unique alternative for transporting Web updates, Usenet News, and streaming media has stirred considerable excitement with ISPs. This session will address

the issues and challenges of satellite broadcast technology, caching hardware/software, and future broadband applications.

# Capacity Planning for Web Performance Virgilio Almeida,

Federal University of Minas Gerais
Daniel Menasce, George Mason University

As more and more businesses rely on distributed Web-based applications, Web performance becomes more and more significant. This session will show ISPs quantitative tools to analyze Web services, discuss issues that affect the performance of Web services, and learn the importance of understanding and characterizing the workload for the Web environment. Also, a methodology for workload characterization will be introduced. Get a step by step guide on how to develop simple models to answer capacity questions.

#### Does Size Matter? Big Pipes vs. Smart Caches

Michael Malcolm, CacheFlow Corporation

To keep up with the Web's growth, ISPs are adding to and upgrading their networks at an alarming pace - and at costs that may be deadly to their business. To handle increasing network loads, is the right business decision to keep increasing monthly bandwidth costs? Or is there a better way that provides a much higher ROI? This session will discuss the business value of active caching and its relative merit over increasing network bandwidth. It will outline the elements of cache performance that most significantly affect ROI, and use real-world business cases for deploying active caches.

## Wave Division Multiplexing

Roselyne Genin, Ericsson Inc

Industry analysts estimate that during the coming years, ISPs will generate a majority of their revenue from value added services such as IP telephony, web hosting, and ecommerce. In the coming years, ISPs will need to consider mechanisms for drawing upon existing infrastructure to develop value added services to reach their revenue and profit objectives cost effectively and quickly.

One strong consideration should be Wave Division Multiplexing (WDM) as a transport vehicle, since it represents a cost effective, capacity generous technology. Of particular importance will be products offering optical layer protection thereby securing the network and guaranteeing customer access, without requiring complicated and expensive multi-layer solutions.

#### Active Caching Panel

Kelly Herrell, CacheFlow Inc

Learn about active caching from ISP real world experiences. Learn how active caches can keep your network at the edge of the Internet to avoid congestion problems. The panel will also discuss the business advantages of caching vs. simply increasing network bandwidth.

# Optimizing with Intelligent Compression, Caching and Flow

Patrick Glenn, Fourelle Systems Inc

As a result of the tremendous growth of the Internet and all its applications, IP traffic will continue to grow. Most service providers typically address the problem of congestion by adding more bandwidth. However, rather than adding capacity by purchasing additional access, a service provider can maximize the use and efficiency of their current network link(s) through the use of Intelligent Compression, caching, and Intelligent Flow Control technologies.

40

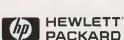
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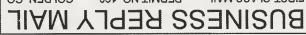
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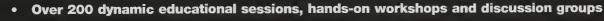
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## September 28 - October 1, 1998

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Register Early and Save! Registration Costs Cancellations must be received in writing to Mecklermedia Corp. by August 17, 1998. Refund amount is the purchase price less \$75 processing fee. No refunds after August 17, 1998					
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Exp. DateTotal amount to charge					
Card holder name					
Card holder signature					
Date					

\*This form is for single registration only. Additional persons must register individually.

A.	Are you involved in the business	☐ 05 Call centers, service desks☐ 07 FTP
	of providing Internet access or	□ 08 DNS
n .	connectivity? 01 Yes	<ul> <li>09 Quality of service agreements,</li> </ul>
	02 No	service level agreements
	Which best describes your primary	99 None of the above
	job function	H. What server platforms are you cur-
	01 Executive Management (CEO,	rently running?
	President, Partner, Owner)	□ 01 UNIX (Linux, BSD, Solaris, SGI, or
	02 Vice president, general manager	other UNIX) □ 02 Windows NT
	03 IS, networking or other technical	□ 03 Both
_	management	99 None of the above
	<ul><li>04 Programmer or software engineer</li><li>05 Sales or marketing management</li></ul>	. At what level do you provide cus-
	06 Operations or financial	tomers with dial-up access?
_	management	01 Worldwide
	98 Other	02 National Local Dial
	(please describe)	03 National 800
C.	What is the primary industry or	04 Regional only     05 Legal only
	business activity in which you are	<ul><li>05 Local only</li><li>What is your estimated planned</li></ul>
	employed?	expenditure level for all network
_	01 ISP (independent Internet service provider)	infrastructure, software, and servi-
	02 Internet information service/Web	ces in your organization, either for
_	site	internal use or resale, in the next 12
a	03 IXC/long distance carrier	months?
	04 Local or regional independent	□ 01 \$25 million or more
	telco	□ 02 \$5-\$24.9 million
	05 Regional Bell (RBOC)	□ 03 \$1 to \$4.9 million □ 04 \$500K to \$999K
	06 Cable TV or broadcast company	□ 05 \$100K to 499K
	07 Satellite services company 08 Power transmission or utility	□ 06 less than \$100K
ч	company	K. Which of the following categories
	09 Telecom consultant/reseller	of products and services will you
	98 Other	be involved in recommending,
	(please describe)	specifying, purchasing, or approv-
D.	Are you involved in specifying,	ing for purchase in your organiza-
	recommending, purchasing, or	tion in the next 12 months (check
	approving the purchase of	all that apply)?  On Networking hardware and
	Internet-related products and	infrastructure
	services: 01 For use in your company as an	☐ 02 Networking software
	ISP	☐ 03 Server hardware
	02 For resale to other companies, as	04 Server software
	a consultant or integrator	05 Security/Firewall products
	03 Both of the above	06 High speed modems/Cable
	99 None of the above	modems
E.	Approximately how big is your	<ul><li>07 Managed Services</li><li>08 Storage systems/data</li></ul>
	current subscriber base in total	warehousing
	individual users (business and consumer)?	09 Web database connectivity and
П	01 50,000 or more	management tools
	02 25,000 to 49,999	10 E-commerce and transaction
	03 12,000 to 24,999	software
	04 5,000 to 11,999	☐ 11 Application development tools
	05 1,000 to 4,999	☐ 12 Web multimedia (audio/video)
	06 less than 1,000	13 Web site analysis tools/content management tools
_	99 None of the above	□ 14 UPS
Б	What is your current number of	☐ 15 Cable and premises wiring
	wholly-owned POPs on your net- work?	☐ 16 Internet telephony
	01 More than 1,000	17 Digital imaging equipment (scan-
	02 500 to 999	ners, cameras, printers)
	03 250 to 499	□ 98 Other
	04 100 to 249	(please describe)
	05 25 to 99	99 None of the above
_	06 less than 25	I wish to receive/continue to
G.	What services do you provide or	receive a free subscription
	plan to provide within the next 12	to Boardwatch Magazine.
	months (check all that apply)? 01 Web and/or database hosting	504 1/
	02 E-commerce (transactions, mer-	□ 01 Yes □ 02 No
_	chant accounts etc.)	
	03 VPNs and/or security solutions	
	04 Network management	Signature
	05 Chat, news, or other content	
	enhancements	Data
		Date

# **Registration Form**

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ISPCON Registration	Information				
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Register Early and Save!					
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A. Are you involved in the business	☐ 06 Call centers, service desks☐ 07 FTP
of providing Internet access or	□ 08 DNS
connectivity?  □ 01 Yes	<ul> <li>09 Quality of service agreements,</li> </ul>
□ 02 No	service level agreements
B. Which best describes your primary	99 None of the above
job function	H. What server platforms are you cur
01 Executive Management (CEO,	rently running?
President, Partner, Owner)	01 UNIX (Linux, BSD, Solaris, SGI, or
O2 Vice president, general manager	other UNIX)
03 IS, networking or other technical	□ 02 Windows NT
management	□ 03 Both
☐ 04 Programmer or software engineer	99 None of the above
□ 05 Sales or marketing management	At what level do you provide cus-
06 Operations or financial	tomers with dial-up access?
· .	□ 01 Worldwide
management	02 National Local Dial
98 Other(please describe)	□ 03 National 800
What is the primary industry or	04 Regional only
business activity in which you are	☐ 05 Local only
	J. What is your estimated planned
employed?	expenditure level for all network
01 ISP (independent Internet service     provider)	infrastructure, software, and servi-
provider)  02 Internet information service/Web	ces in your organization, either for
	internal use or resale, in the next 12
Site	months?
03 IXC/long distance carrier	□ 01 \$25 million or more
04 Local or regional independent	□ 02 \$5-\$24.9 million
telco	□ 03 \$1 to \$4.9 million
05 Regional Bell (RBOC)      Coble TV or breadesst common to the co	□ 04 \$500K to \$999K
□ 06 Cable TV or broadcast company	□ 05 \$100K to 499K
□ 07 Satellite services company	□ 06 less than \$100K
08 Power transmission or utility	K. Which of the following categories
company	of products and services will you
09 Telecom consultant/reseller	be involved in recommending,
□ 98 Other	
(please describe)	specifying, purchasing, or approving for purchase in your organiza-
D. Are you involved in specifying,	ing for purchase in your organiza-
recommending, purchasing, or	tion in the next 12 months (check
approving the purchase of	all that apply)?
Internet-related products and	O1 Networking hardware and     infrastructure
services:	infrastructure
O1 For use in your company as an	02 Networking software
ISP	□ 03 Server hardware
<ul><li>02 For resale to other companies, as</li></ul>	□ 04 Server software
a consultant or integrator	05 Security/Firewall products
03 Both of the above	06 High speed modems/Cable
99 None of the above	modems
Approximately how big is your	□ 07 Managed Services
current subscriber base in total	08 Storage systems/data
individual users (business and	warehousing
consumer)?	09 Web database connectivity and
□ 01 50,000 or more	management tools
□ 02 25,000 to 49,999	10 E-commerce and transaction
□ 03 12,000 to 24,999	software
□ 04 5,000 to 11,999	□ 11 Application development tools
□ 05 1,000 to 4,999	12 Web multimedia (audio/video)
☐ 06 less than 1,000	13 Web site analysis tools/content
99 None of the above	management tools
E What is your current number of	☐ 14 UPS
wholly-owned POPs on your net-	15 Cable and premises wiring
work?	□ 16 Internet telephony
□ 01 More than 1,000	17 Digital imaging equipment (scan-
□ 02 500 to 999	ners, cameras, printers)
□ 03 250 to 499	□ 98 Other
□ 04 100 to 249	(please describe)
□ 05 25 to 99	☐ 99 None of the above
□ 06 less than 25	
G. What services do you provide or	I wish to receive/continue to
plan to provide within the next 12	receive a free subscription
	to Boardwatch Magazine.
months (check all that apply)?  □ 01 Web and/or database hosting	
02 E-commerce (transactions, mer-	□ 01 Yes □ 02 No
the state of the s	
chant accounts etc.)	
03 VPNs and/or security solutions     04 Network management	
<ul><li>04 Network management</li><li>05 Chat, news, or other content</li></ul>	Signature
	-
enhancements	Date

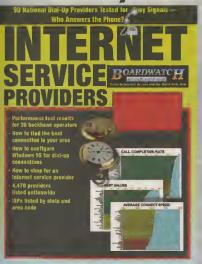
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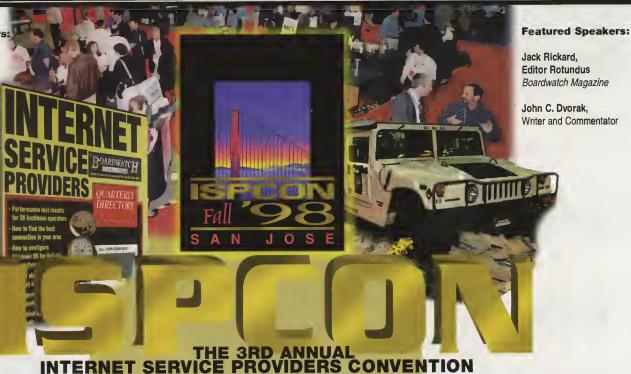
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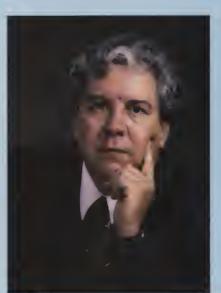




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Jack Rickard
Editor Rotundus Boardwatch Magazine

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Credit Card #				
Exp. DateTotal amount to charge				
Card holder name				
Card holder signature				
Date				
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A. I wish to receive/continue to	H. What services do you provide or
receive a free subscription to <i>Boardwatch Magazine</i> .	plan to provide within the next 12 months (check all that apply)?  □ 01 Web and/or database hosting
□ 01 Yes □ 02 No	□ 02 E-commerce (transactions, mer-
Signature	chant accounts etc.)
Date	<ul><li>03 VPNs and/or security solutions</li><li>04 Network management</li></ul>
_	□ 05 Chat, news, or other content
B. Are you involved in the business	enhancements  Of Call centers, service desks
of providing Internet access or connectivity?	O7 FTP
□ 01 Yes □ 02 No	08 DNS     09 Quality of carving agreements
Which best describes your primary	<ul> <li>09 Quality of service agreements, service level agreements</li> </ul>
job function	99 None of the above What server platforms are you cur-
<ul> <li>01 Executive Management (CEO, President, Partner, Owner)</li> </ul>	rently running?
02 Vice president, general manager     03 IS networking or other technical	O1 UNIX (Linux, BSD, Solaris, SGI, or other UNIX)
<ul> <li>03 IS, networking or other technical management</li> </ul>	□ 02 Windows NT
□ 04 Programmer or software engineer	<ul><li>03 Both</li><li>99 None of the above</li></ul>
<ul><li>05 Sales or marketing management</li><li>06 Operations or financial</li></ul>	At what level do you provide cus-
management	tomers with dial-up access?  □ 01 Worldwide
98 Other(please describe)	☐ 02 National Local Dial
What is the primary industry or	□ 03 National 800
business activity in which you are employed?	<ul><li>04 Regional only</li><li>05 Local only</li></ul>
01 ISP (independent Internet service)	K. What is your estimated planned
provider)  O2 Internet information service/Web	expenditure level for all network infrastructure, software, and ser-
site	vices in your organization, either for
<ul> <li>03 IXC/long distance carrier</li> <li>04 Local or regional independent</li> </ul>	internal use or resale, in the next 12 months?
telco	□ 01 \$25 million or more
<ul><li>05 Regional Bell (RBOC)</li><li>06 Cable TV or broadcast company</li></ul>	☐ 02 \$5-\$24.9 million ☐ 03 \$1 to \$4.9 million
07 Satellite services company	□ 04 \$500K to \$999K
<ul> <li>08 Power transmission or utility company</li> </ul>	□ 05 \$100K to 499K □ 06 less than \$100K
09 Telecom consultant/reseller	Which of the following categories
98 Other(please describe)	of products and services will you be involved in recommending.
Are you involved in specifying,	specifying, purchasing, or approv-
recommending, purchasing, or approving the purchase of	ing for purchase in your organiza-
Internet-related products and	tion in the next 12 months (check all that apply)?
services:  O1 For use in your company as an	<ul> <li>01 Networking hardware and infrastructure</li> </ul>
ISP	□ 02 Networking software
<ul> <li>02 For resale to other companies, as a consultant or integrator</li> </ul>	<ul><li>03 Server hardware</li><li>04 Server software</li></ul>
O3 Both of the above	☐ 05 Security/Firewall products
<ul><li>99 None of the above</li><li>Approximately how big is your cur-</li></ul>	O6 High speed modems/Cable modems
rent subscriber base in total indi-	☐ 07 Managed Services
vidual users (business and con- sumer)?	<ul> <li>08 Storage systems/data warehousing</li> </ul>
□ 01 50,000 or more	09 Web database connectivity and
□ 02 25,000 to 49,999 □ 03 12,000 to 24,999	management tools  10 E-commerce and transaction
□ 04 5,000 to 11,999	software
□ 05 1,000 to 4,999 □ 06 less than 1,000	<ul> <li>11 Application development tools</li> <li>12 Web multimedia (audio/video)</li> </ul>
99 None of the above	☐ 13 Web site analysis tools/content
G. What is your current number of wholly-owned POPs on your net-	management tools  14 UPS
work?	☐ 14 OPS☐ 15 Cable and premises wiring
□ 01 More than 1,000 □ 02 500 to 999	16 Internet telephony
□ 03 250 to 499	<ul> <li>17 Digital imaging equipment (scanners, cameras, printers)</li> </ul>
□ 04 100 to 249	D 00 Other

06 less than 25 ☐ 99 None of the above

☐ 98 Other

(please describe)

□ 05 25 to 99